

Appendix A-A

Figures

Appendix A-A Figures

Figure A1: Project Area geology

Figure A2: ASRIS acid sulfate soil classification

Figure A3: Sampling locations

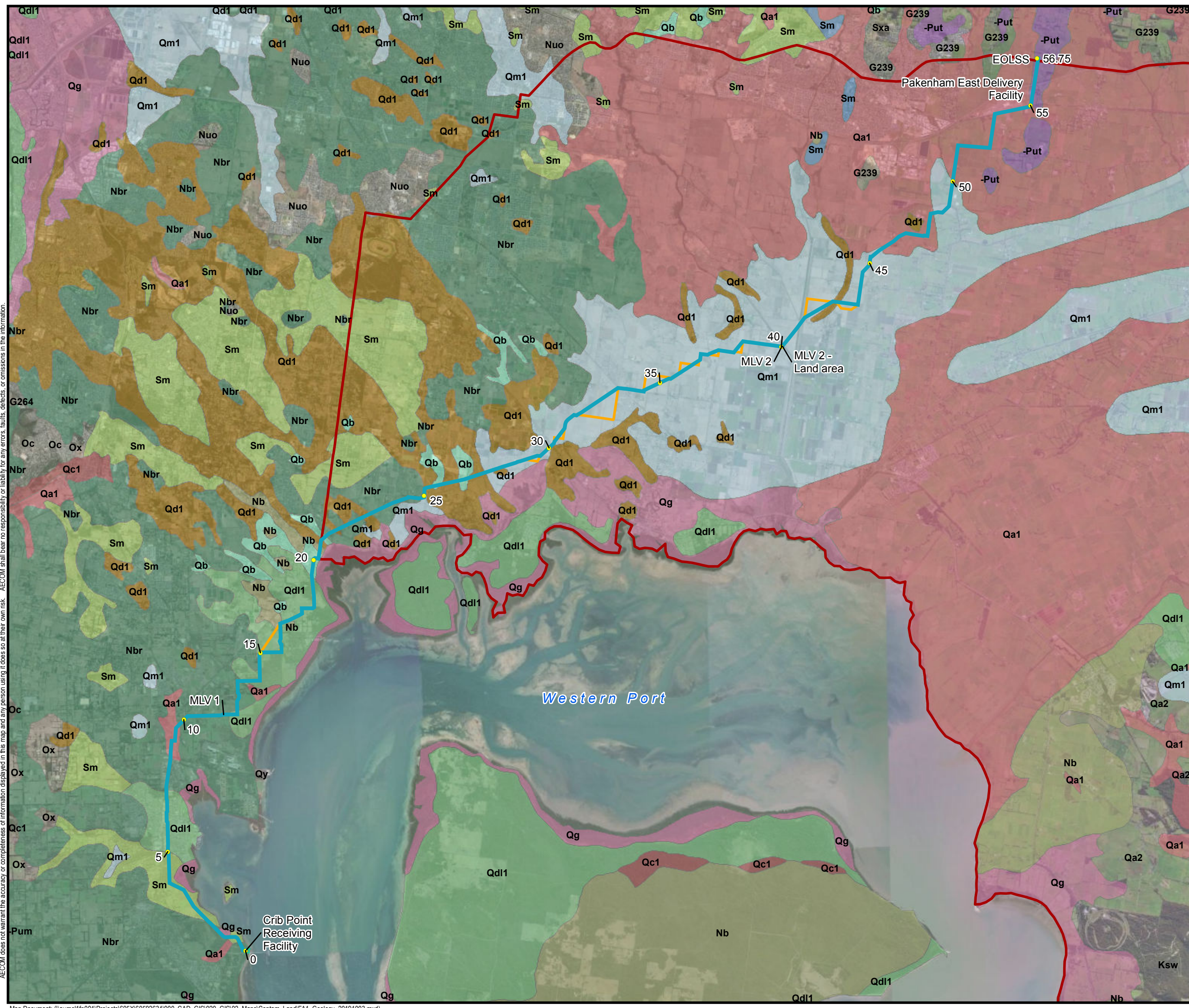
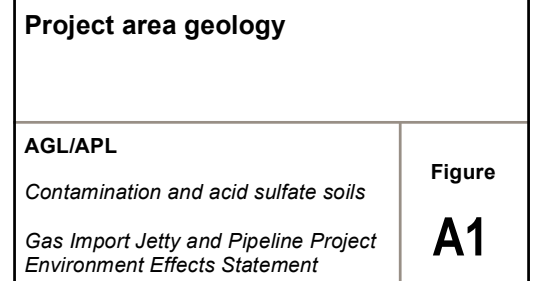
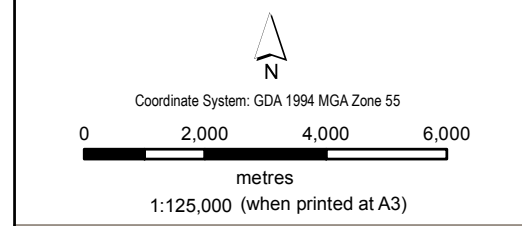
Figure A4: Groundwater salinity

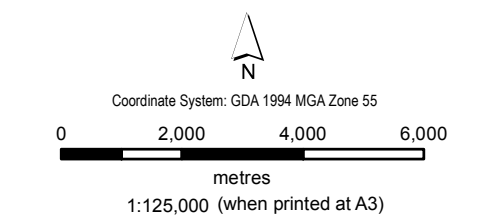
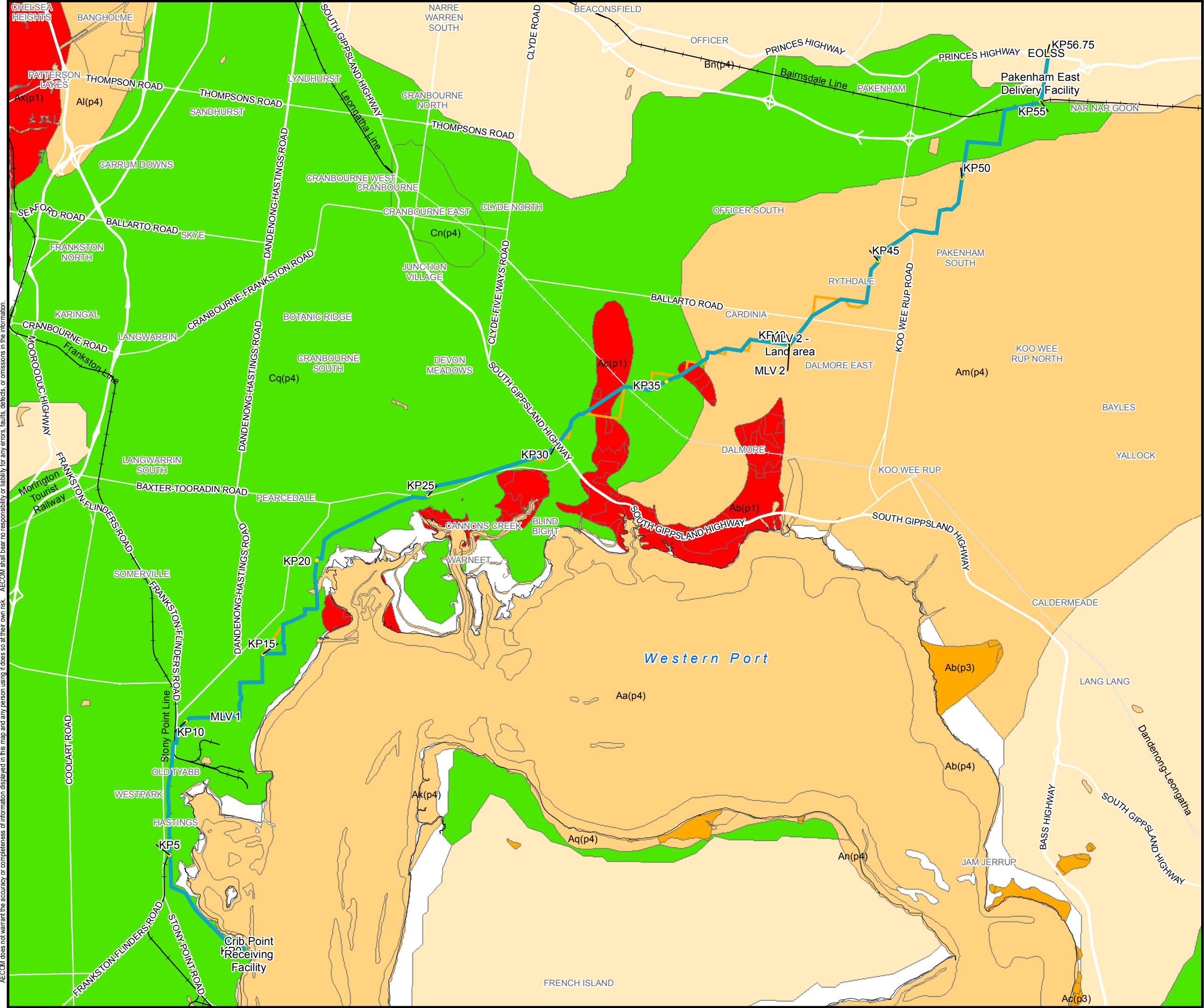
Figure A5: Contaminated soils results – exceedances

Figure A6: Acid sulfate soils results

Figure A7: Contaminated groundwater results – exceedances

Figure A8: Contaminated marine sediments results – exceedances





LEGEND

Kilometre points

Pipeline

Pipeline Alignment Options

National Acid Sulfate Soils Atlas

High Probability/ High Confidence

High Probability/ Low Confidence

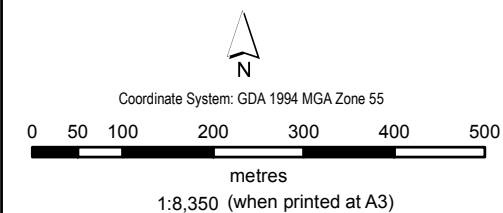
High Probability/ Very Low Confidence


Low Probability/ Very Low Confidence

Extremely Low Probability/ Very Low Confidence


ASRIS acid sulfate soil classification

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- LEGEND
- 


Groundwater monitoring bore




Grid soil bore




Targeted soil bore




Targeted soil bore analysed for PFAS




Open - Cut




Trenchless




Total Study Area




Easement




Construction Footprint




Cadastre (adjusted)



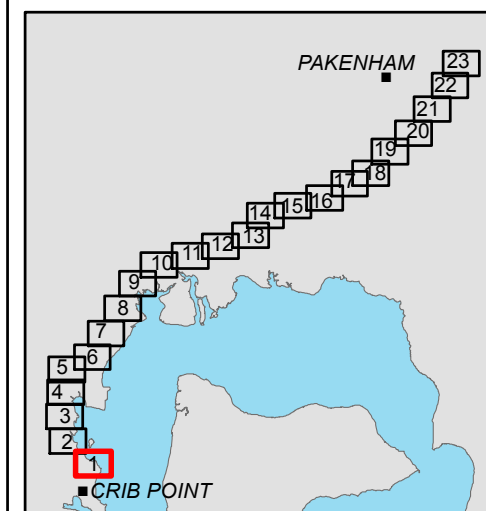
Crib Point Receiving Facility



Waterbody



Cadastre



Sampling Locations

Pipeline - Mapsheet 1 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

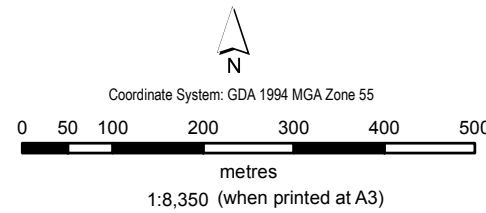
Figure
A3-1

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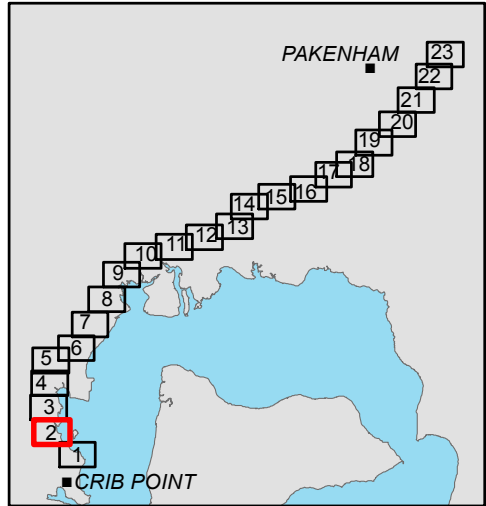
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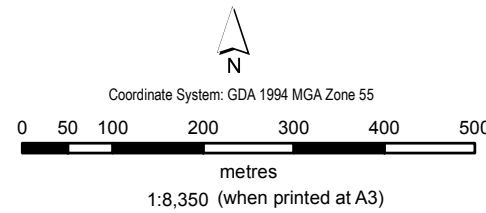


- LEGEND**
- Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Rail
 - Watercourse
 - Waterbody
 - Cadastre



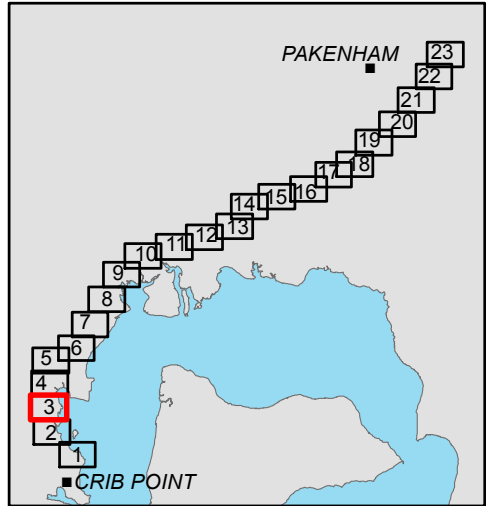
Sampling Locations	
Pipeline - Mapsheet 2 (of 23)	
APA Contamination and acid sulfate soils Gas Import Jetty and Pipeline Project Environment Effects Statement	Figure A3-2

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LEGEND

- Kilometre points
- Groundwater monitoring bore
- Grid soil bore
- Targeted soil bore
- Open - Cut
- Trenchless
- Total Study Area
- Easement
- Construction Footprint
- Cadastre (adjusted)
- Rail
- Watercourse
- Waterbody
- Cadastre



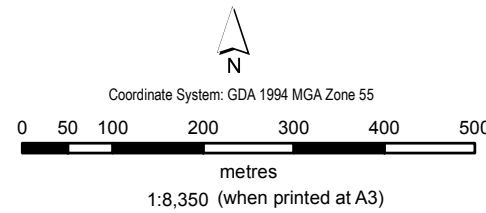
Sampling Locations

Pipeline - Mapsheet 3 (of 23)

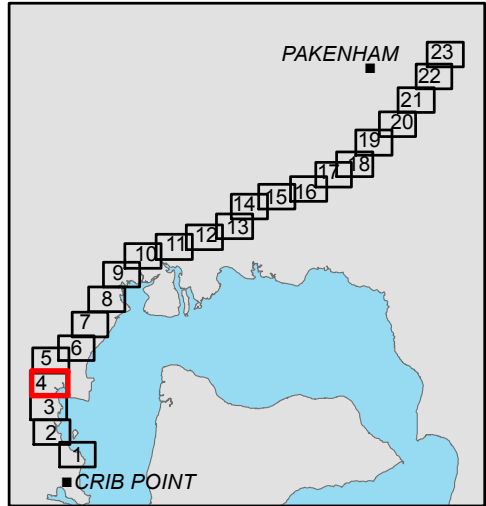
APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A3-3

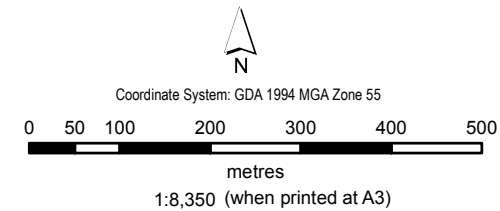
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- LEGEND**
- Groundwater monitoring bore
 - Grid soil bore
 - Targeted soil bore
 - Targeted soil bore analysed for PFAS
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Rail
 - Watercourse
 - Waterbody
 - Cadastre

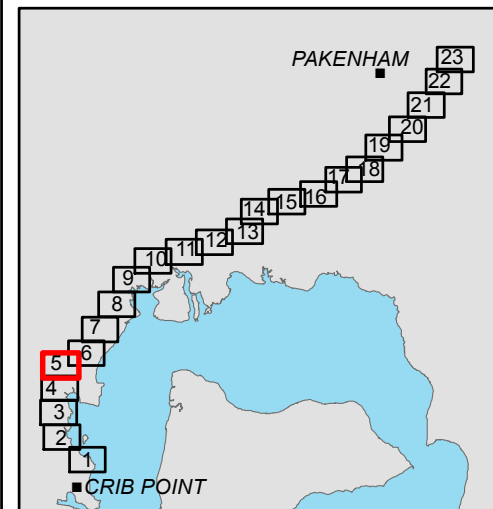


Sampling Locations	
Pipeline - Mapsheet 4 (of 23)	
APA Contamination and acid sulfate soils Gas Import Jetty and Pipeline Project Environment Effects Statement	Figure A3-4



LEGEND

- Kilometre points
- Groundwater monitoring bore
- Grid soil bore
- Targeted soil bore analysed for PFAS
- Open - Cut
- Trenchless
- Total Study Area
- Easement
- Construction Footprint
- Cadastre (adjusted)
- Rail
- Watercourse
- Waterbody
- Cadastre

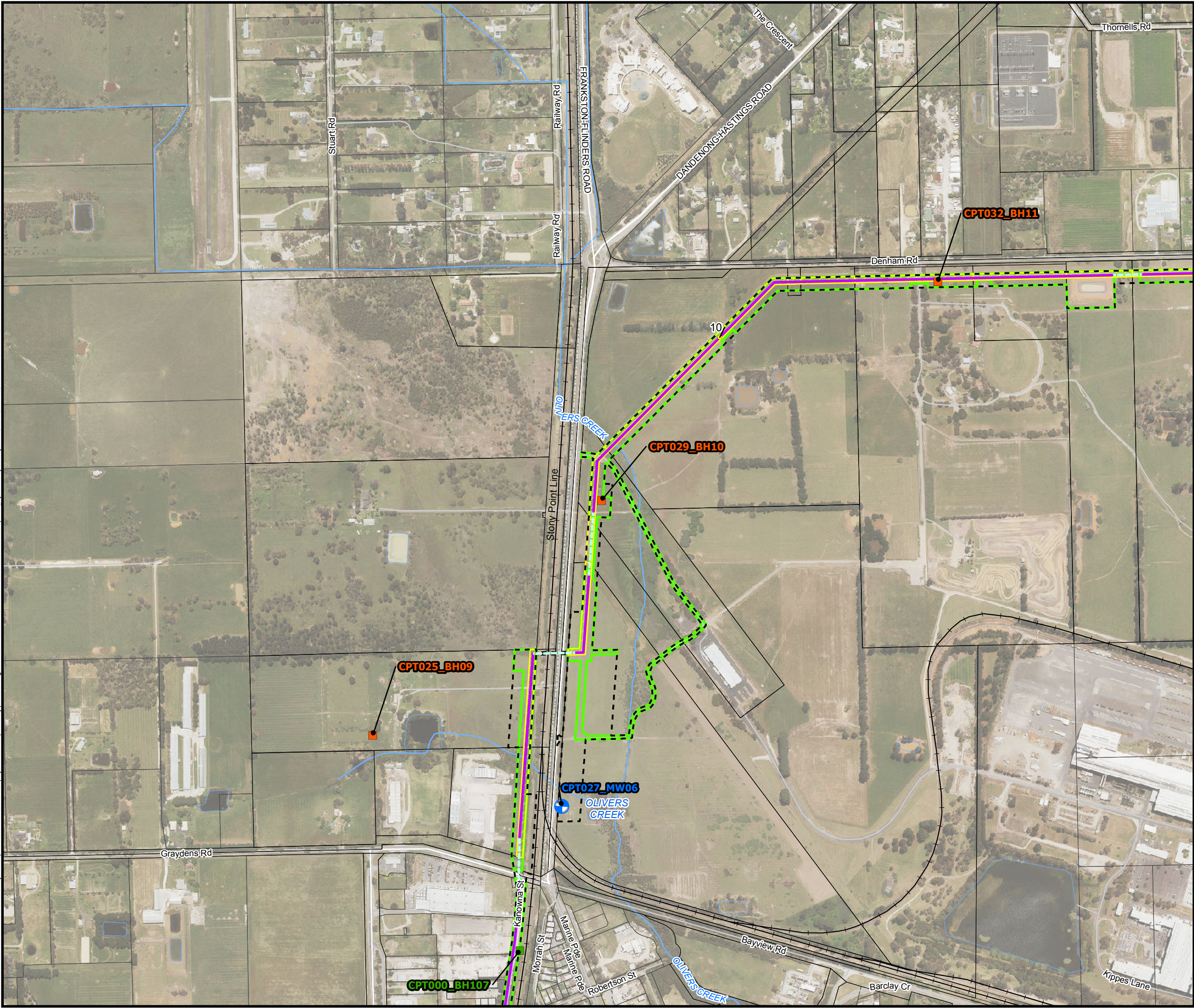


Sampling Locations

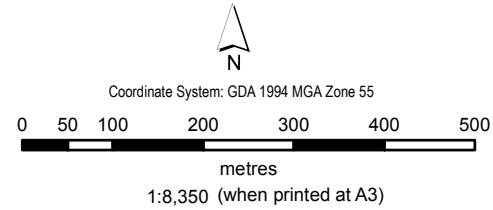
Pipeline - Mapsheet 5 (of 23)

APA
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Gas Import Jetty and Pipeline Project
Environment Effects Statement

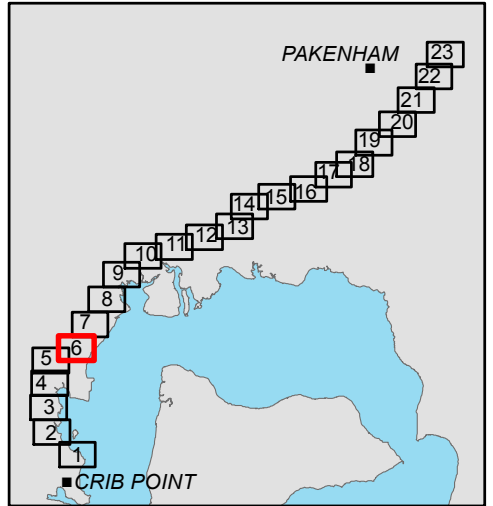
Figure
A3-5



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- LEGEND**
- Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - MLV 1
 - Watercourse
 - Waterbody
 - Cadastre



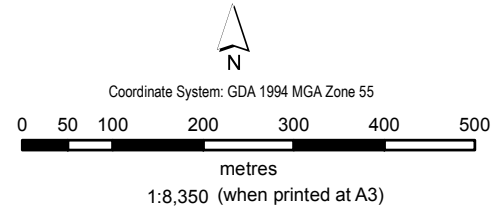
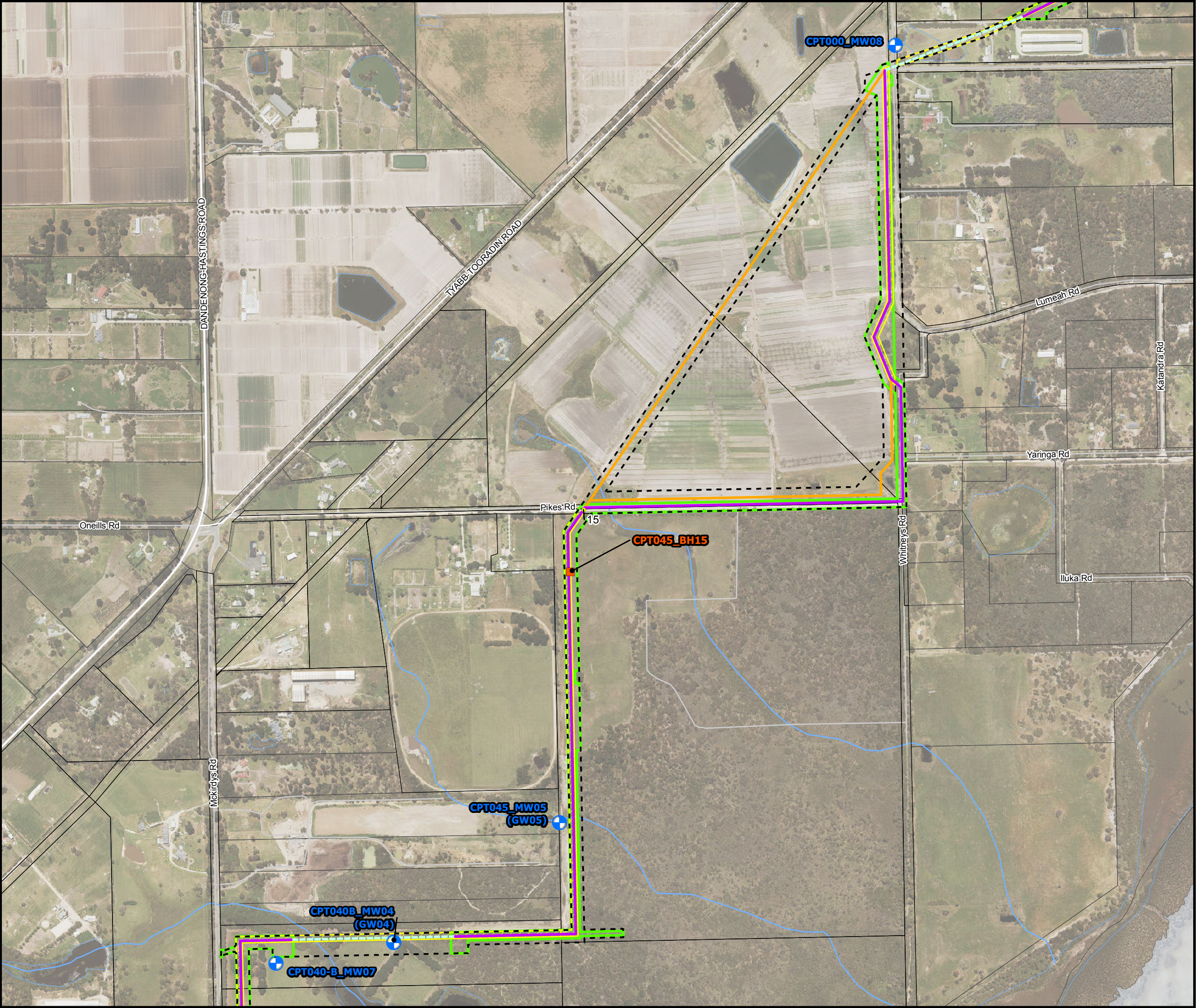
Sampling Locations

Pipeline - Mapsheet 6 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

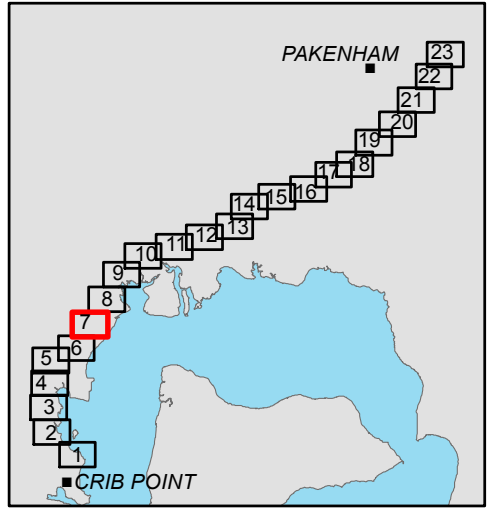
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A3-6

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LEGEND

- Kilometre points
- ⊕ Groundwater monitoring bore
- Grid soil bore
- Open - Cut
- Trenchless
- Pipeline Alignment Options
- - - Total Study Area
- ▨ Easement
- ▭ Construction Footprint
- ▭ Cadastre (adjusted)
- Watercourse
- ▭ Waterbody
- ▭ Cadastre



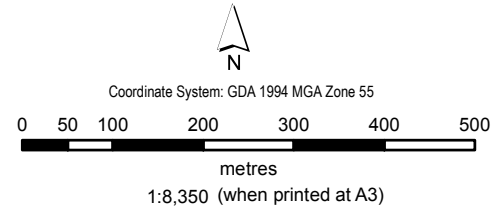
Sampling Locations

Pipeline - Mapsheet 7 (of 23)

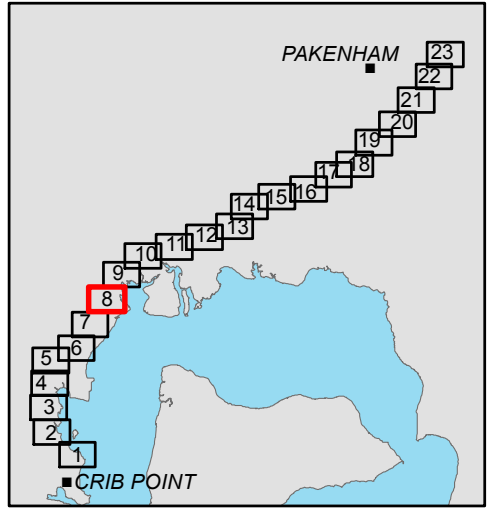
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Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A3-7

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- LEGEND**
- Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Watercourse
 - Waterbody
 - Cadastre



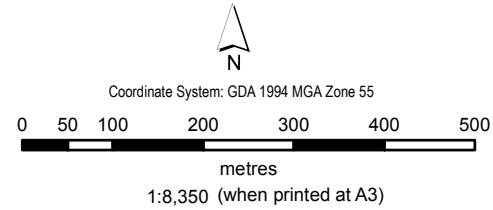
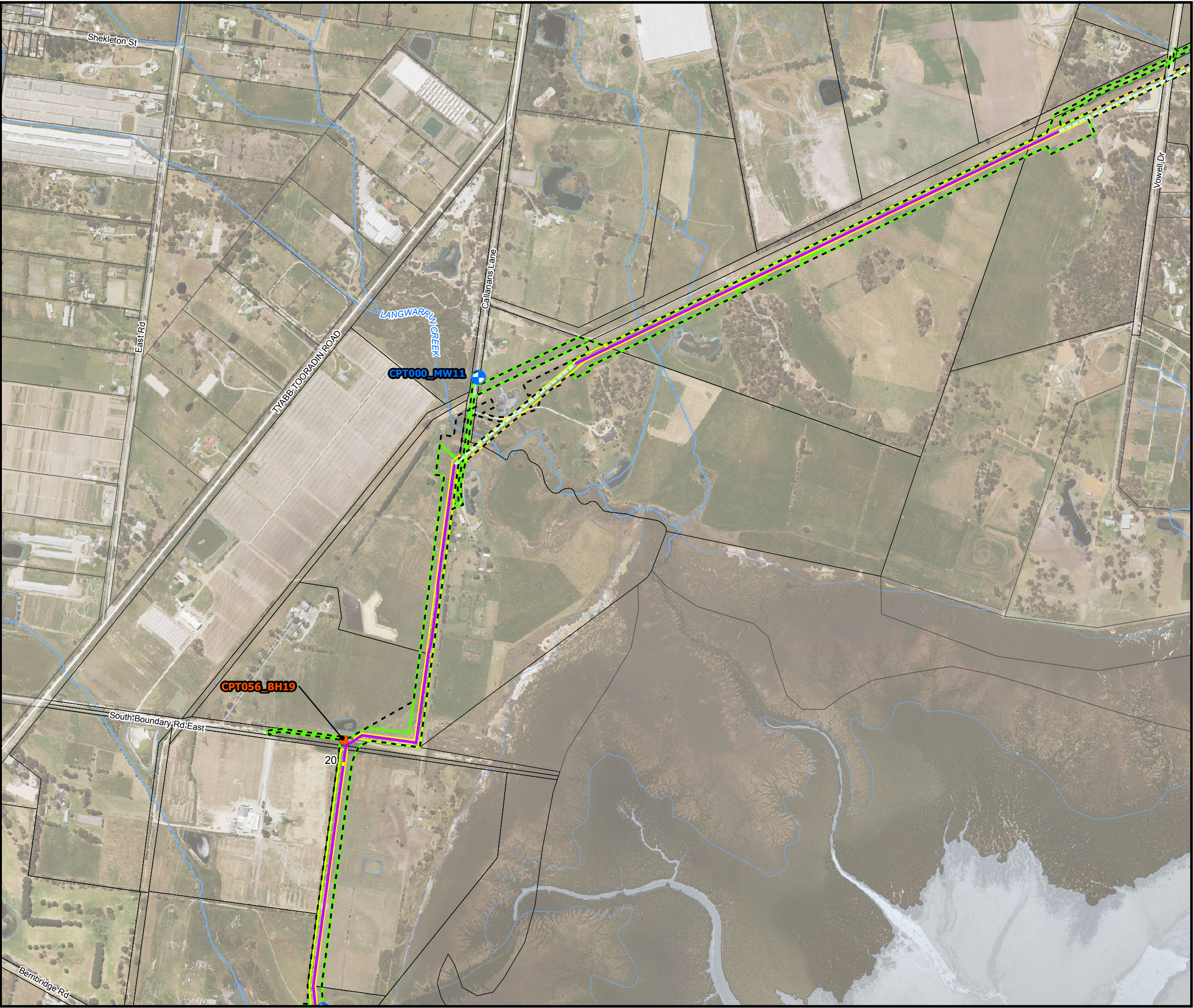
Sampling Locations

Pipeline - Mapsheet 8 (of 23)

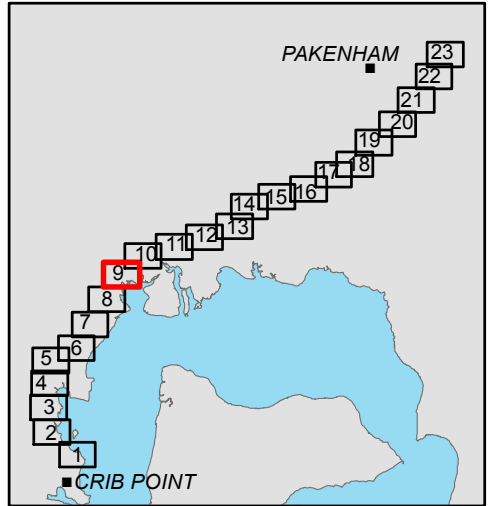
APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A3-8

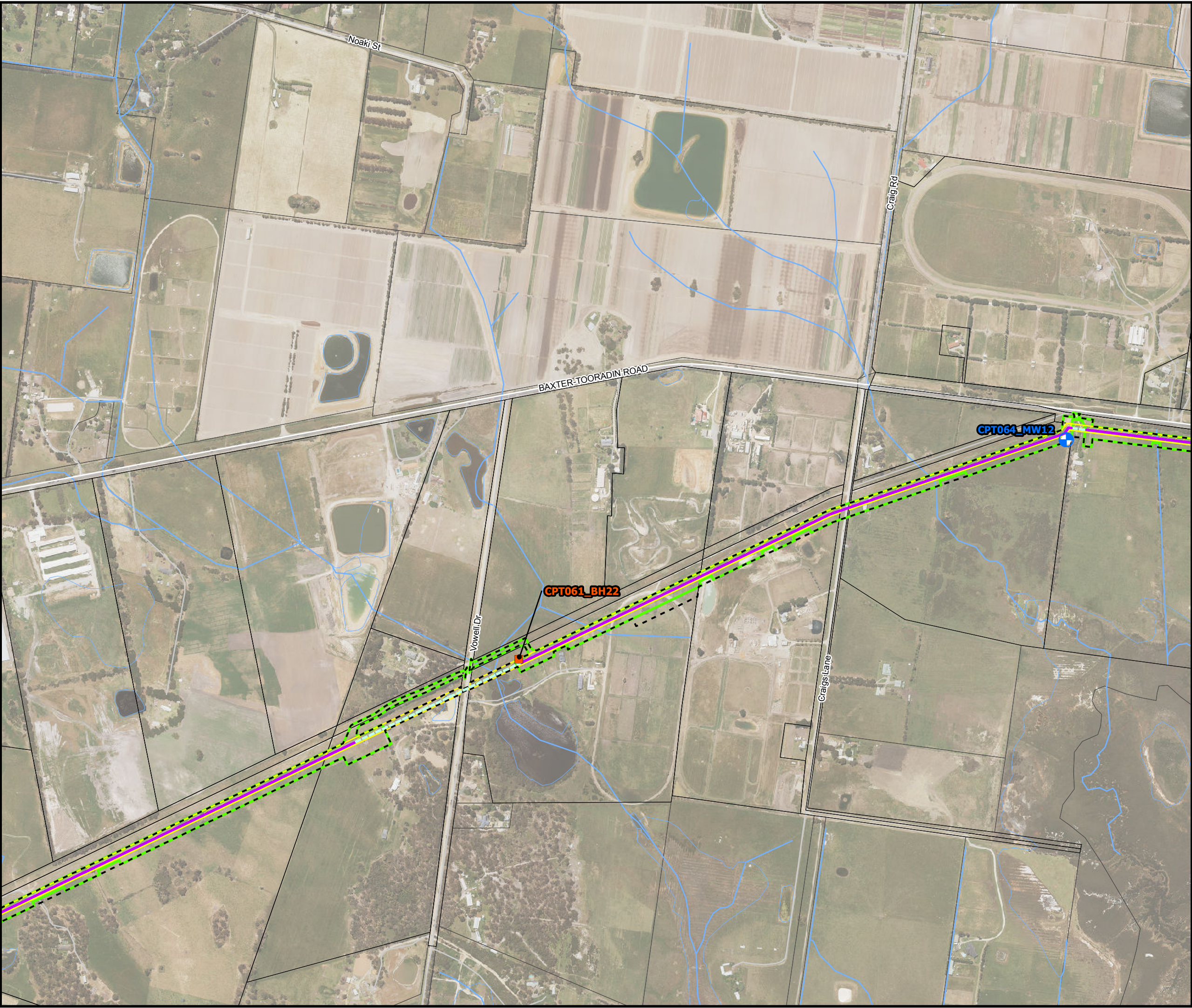
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- LEGEND**
- Kilometre points
 - Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastral (adjusted)
 - Watercourse
 - Waterbody
 - Cadastral

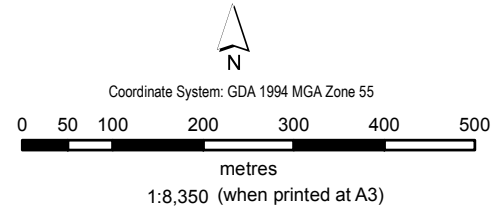


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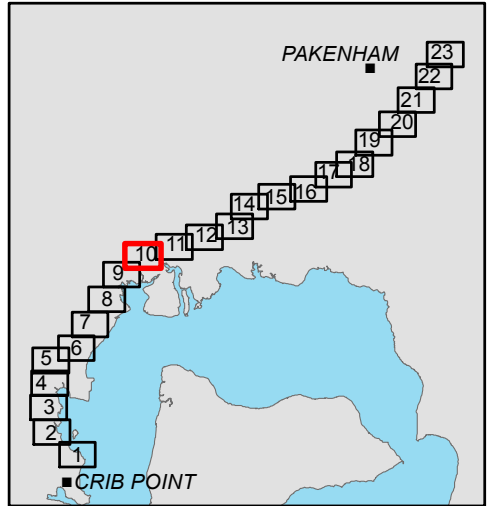


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- LEGEND**
- Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Watercourse
 - Waterbody
 - Cadastre

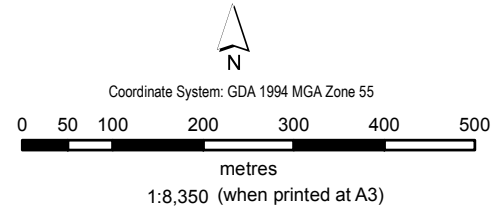
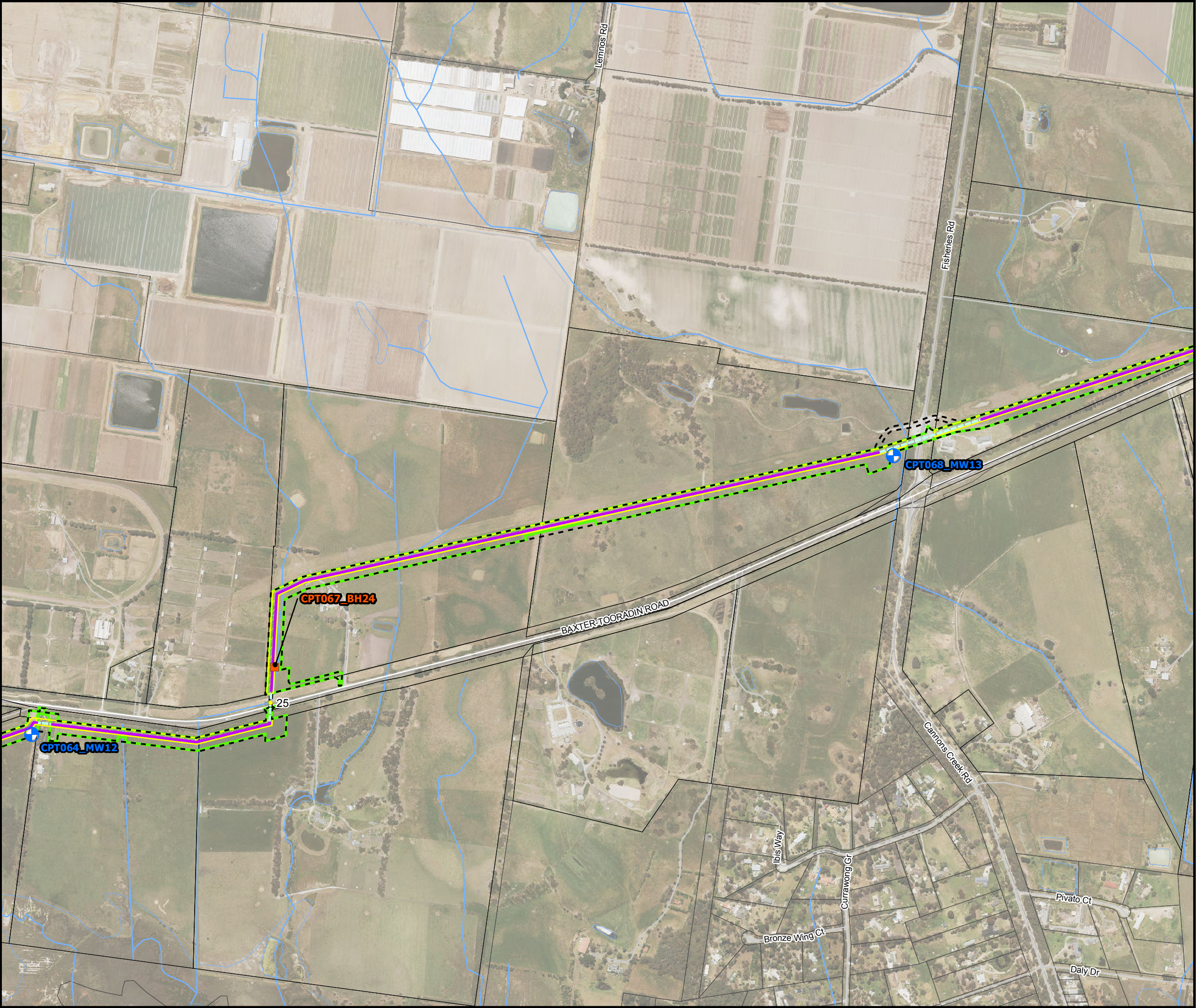


Sampling Locations

Pipeline - Mapsheet 10 (of 23)

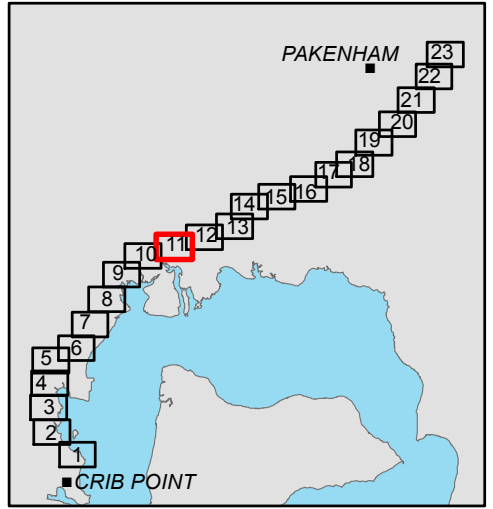
APA Contamination and acid sulfate soils Gas Import Jetty and Pipeline Project Environment Effects Statement	Figure A3-10
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LEGEND

- Kilometre points
- ⊕ Groundwater monitoring bore
- Grid soil bore
- Open - Cut
- Trenchless
- - - Total Study Area
- ▨ Easement
- ▭ Construction Footprint
- ▭ Cadastre (adjusted)
- Watercourse
- ▭ Waterbody
- ▭ Cadastre

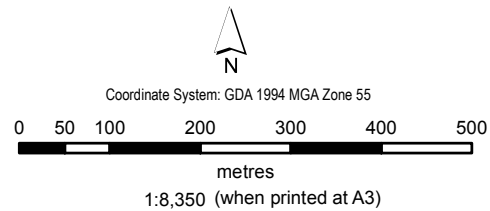


Sampling Locations

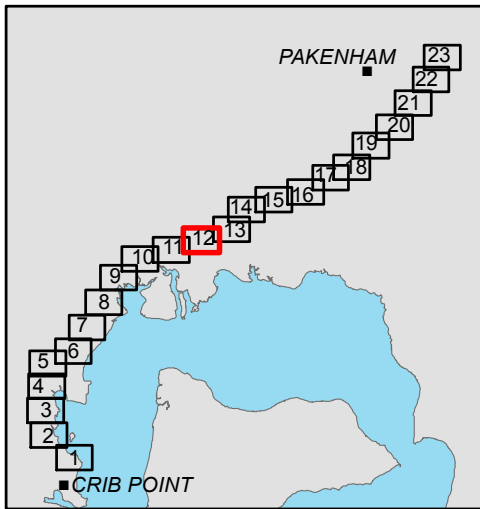
Pipeline - Mapsheet 11 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A3-11



- LEGEND
- Kilometre points
 - Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Watercourse
 - Waterbody
 - Cadastre



Sampling Locations

Pipeline - Mapsheet 12 (of 23)

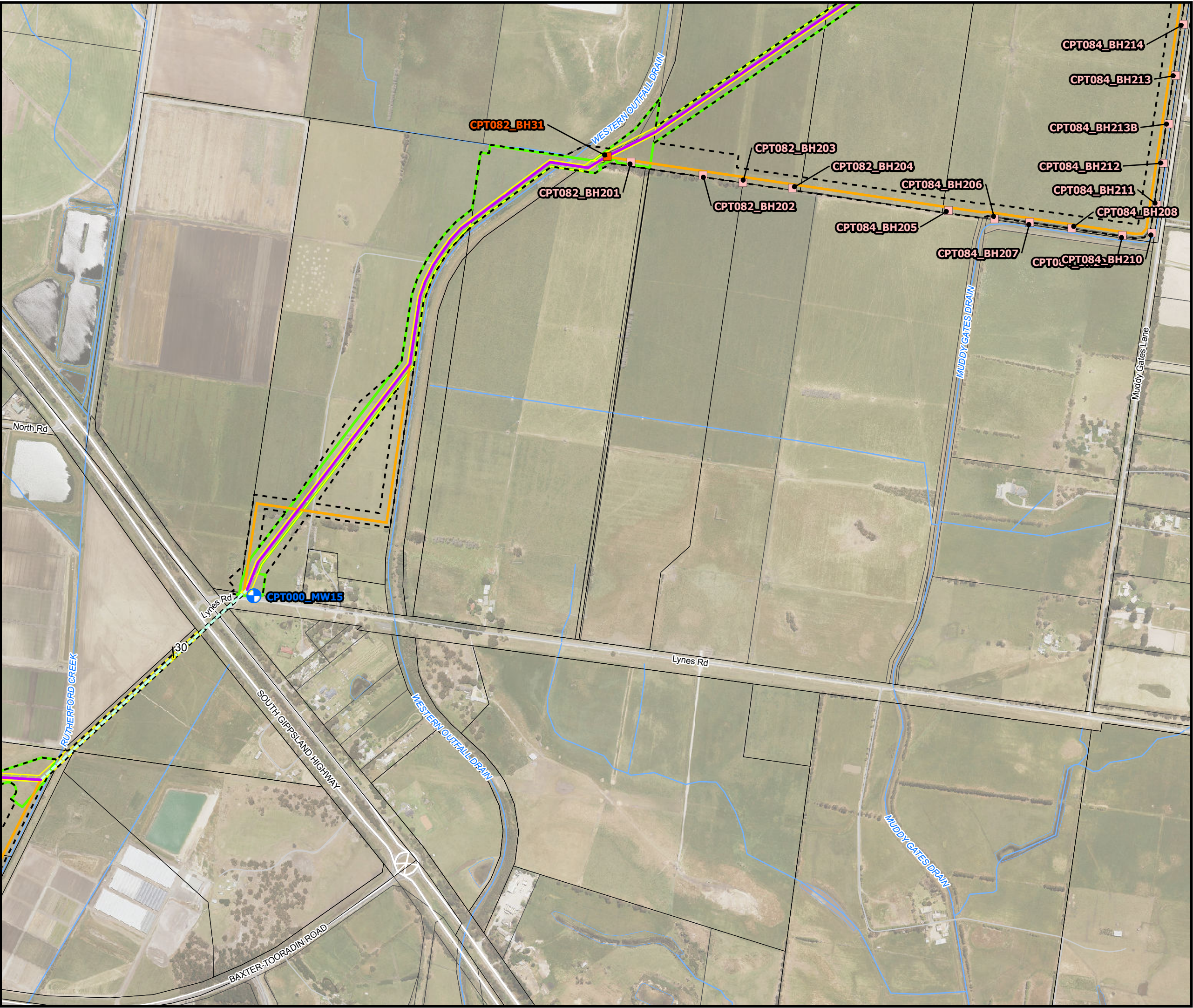
APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A3-12

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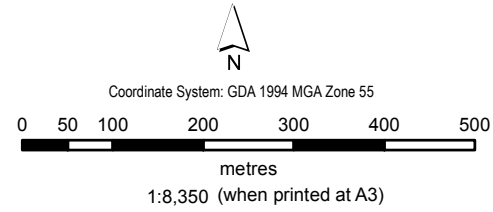


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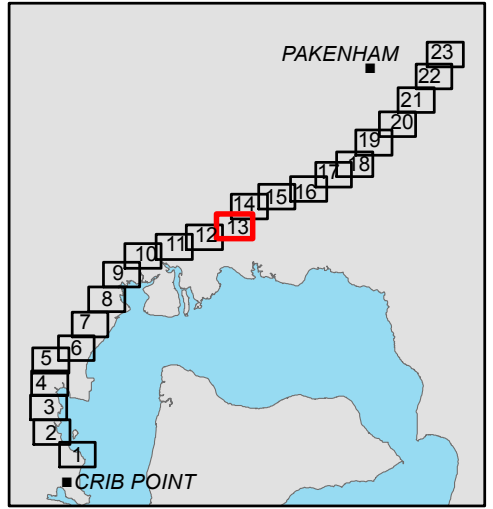
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LEGEND

- Kilometre points
- Groundwater monitoring bore
- Targeted acid sulfate soil bore
- Grid soil bore
- Open - Cut
- Trenchless
- Pipeline Alignment Options
- Total Study Area
- Easement
- Construction Footprint
- Cadastre (adjusted)
- Watercourse
- Waterbody
- Cadastre



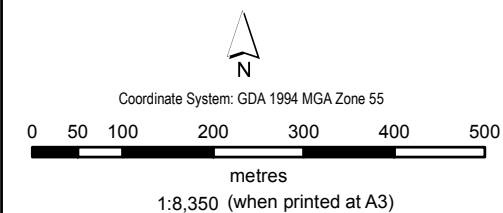
Sampling Locations

Pipeline - Mapsheet 13 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure

A3-13



- LEGEND
- Groundwater monitoring bore

Targeted acid sulfate soil bore

Grid soil bore

Grid soil bore

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Easement

Construction Footprint

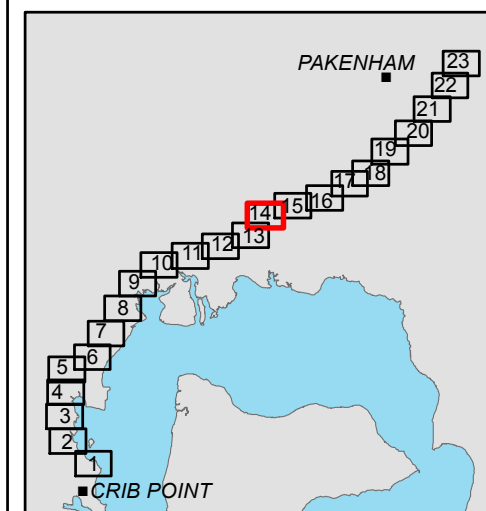
Cadastre (adjusted)

Rail disused/ dismantled/ rail trail

Watercourse

Waterbody

Cadastre



Sampling Locations

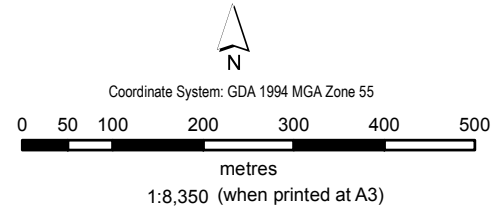
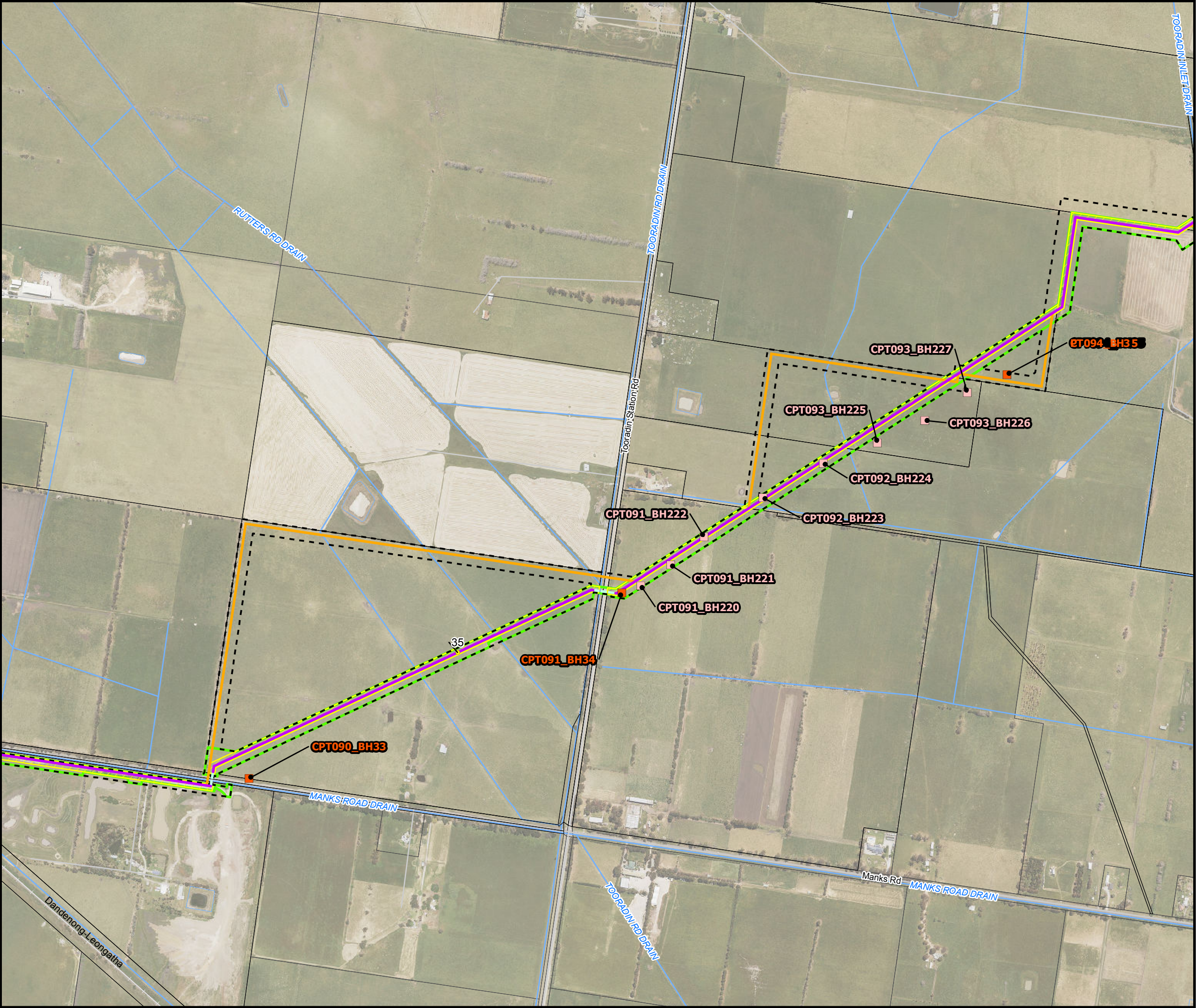
Pipeline - Mapsheet 14 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

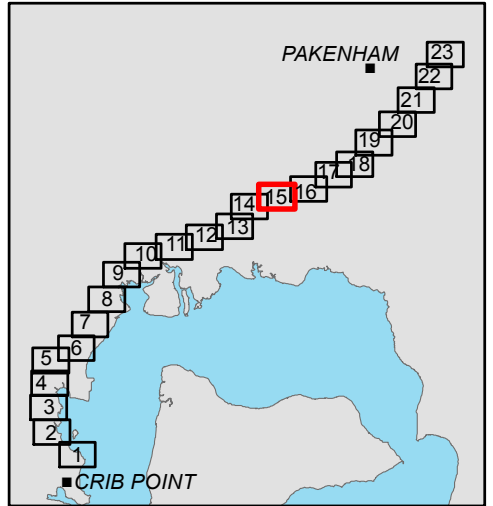
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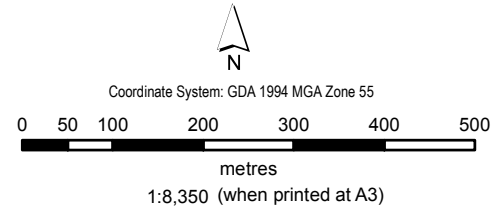
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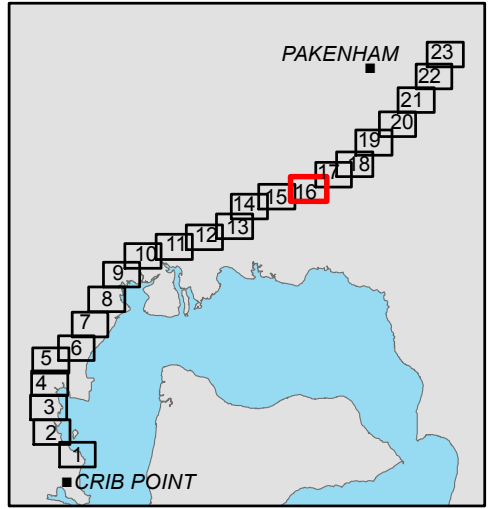
- LEGEND**
- Kilometre points
 - Targeted acid sulfate soil bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Rail disused/ dismantled/ rail trail
 - Watercourse
 - Waterbody
 - Cadastre



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- LEGEND**
- Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Watercourse
 - Waterbody
 - Cadastre



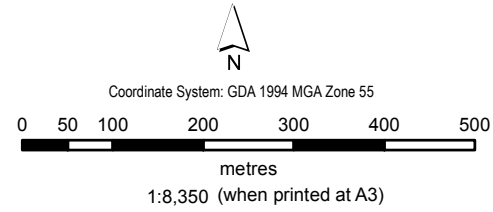
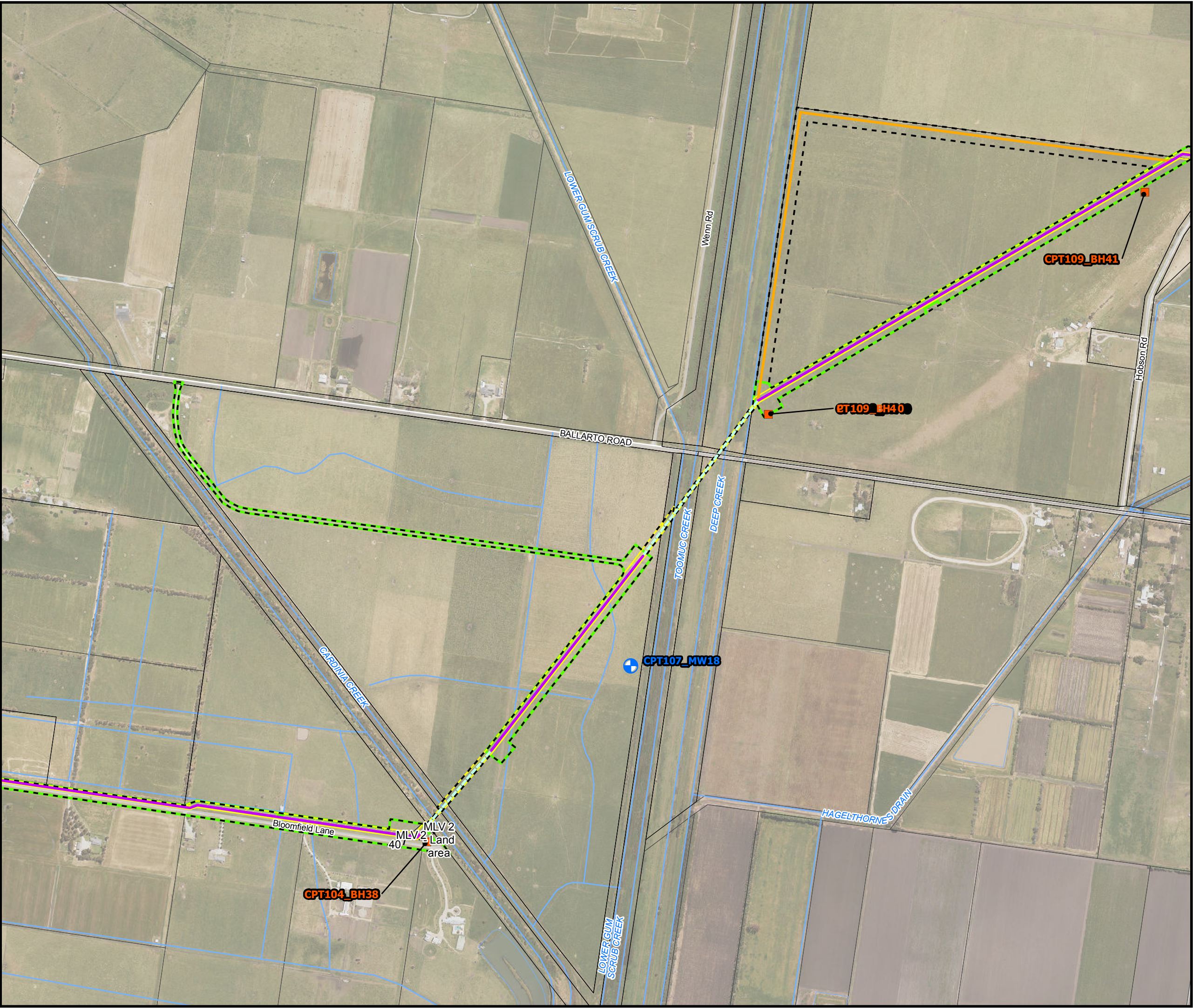
Sampling Locations

Pipeline - Mapsheet 16 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

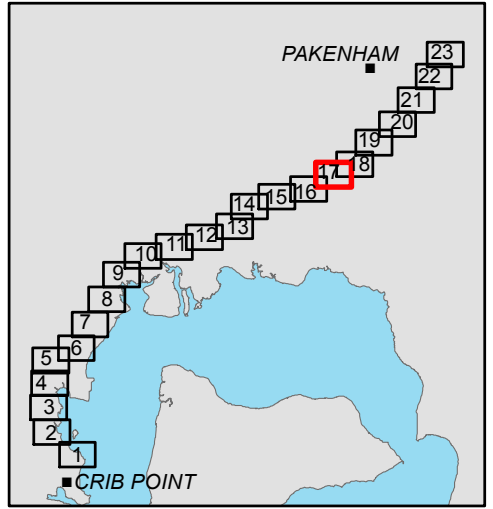
Figure
A3-16

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LEGEND

- Kilometre points
- Groundwater monitoring bore
- Grid soil bore
- Open - Cut
- Trenchless
- Pipeline Alignment Options
- Total Study Area
- Easement
- Construction Footprint
- Cadastre (adjusted)
- MLV 2
- MLV 2 - Land area
- Watercourse
- Waterbody
- Cadastre



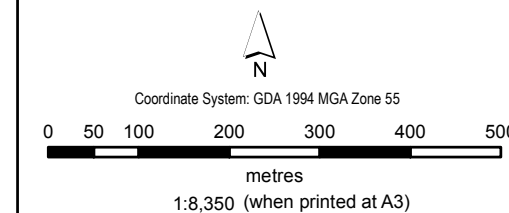
Sampling Locations


Pipeline - Mapsheet 17 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement


Figure

A3-17




- LEGEND
- 


Groundwater monitoring bore




Grid soil bore




Open - Cut




Trenchless




Pipeline Alignment Options




Total Study Area



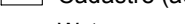
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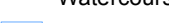
Construction Footprint



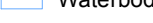
Cadastre (adjusted)



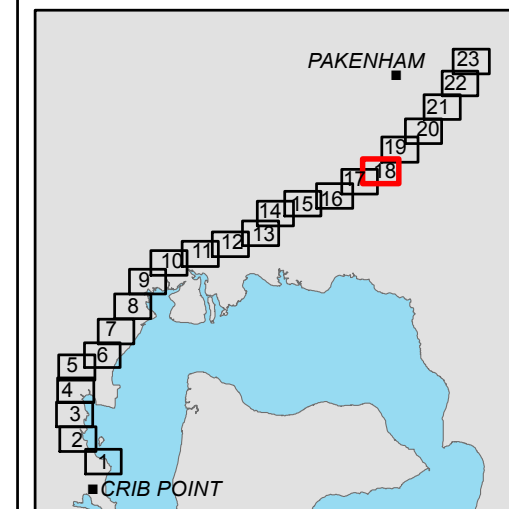
Watercourse



Waterbody

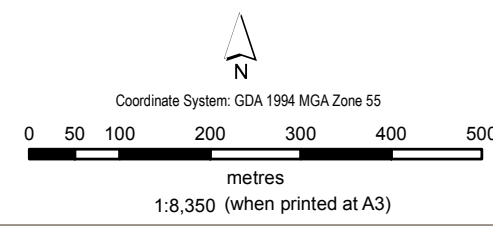


Cadastre

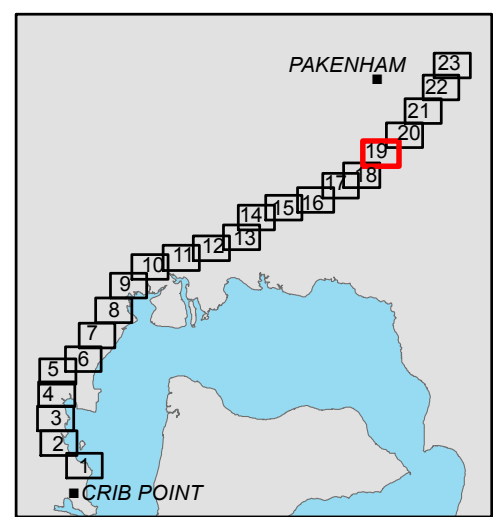


Sampling Locations	
Pipeline - Mapsheet 18 (of 23)	
APA Contamination and acid sulfate soils Gas Import Jetty and Pipeline Project Environment Effects Statement	Figure A3-18

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- LEGEND
- Kilometre points
 - Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastre (adjusted)
 - Watercourse
 - Waterbody
 - Cadastre



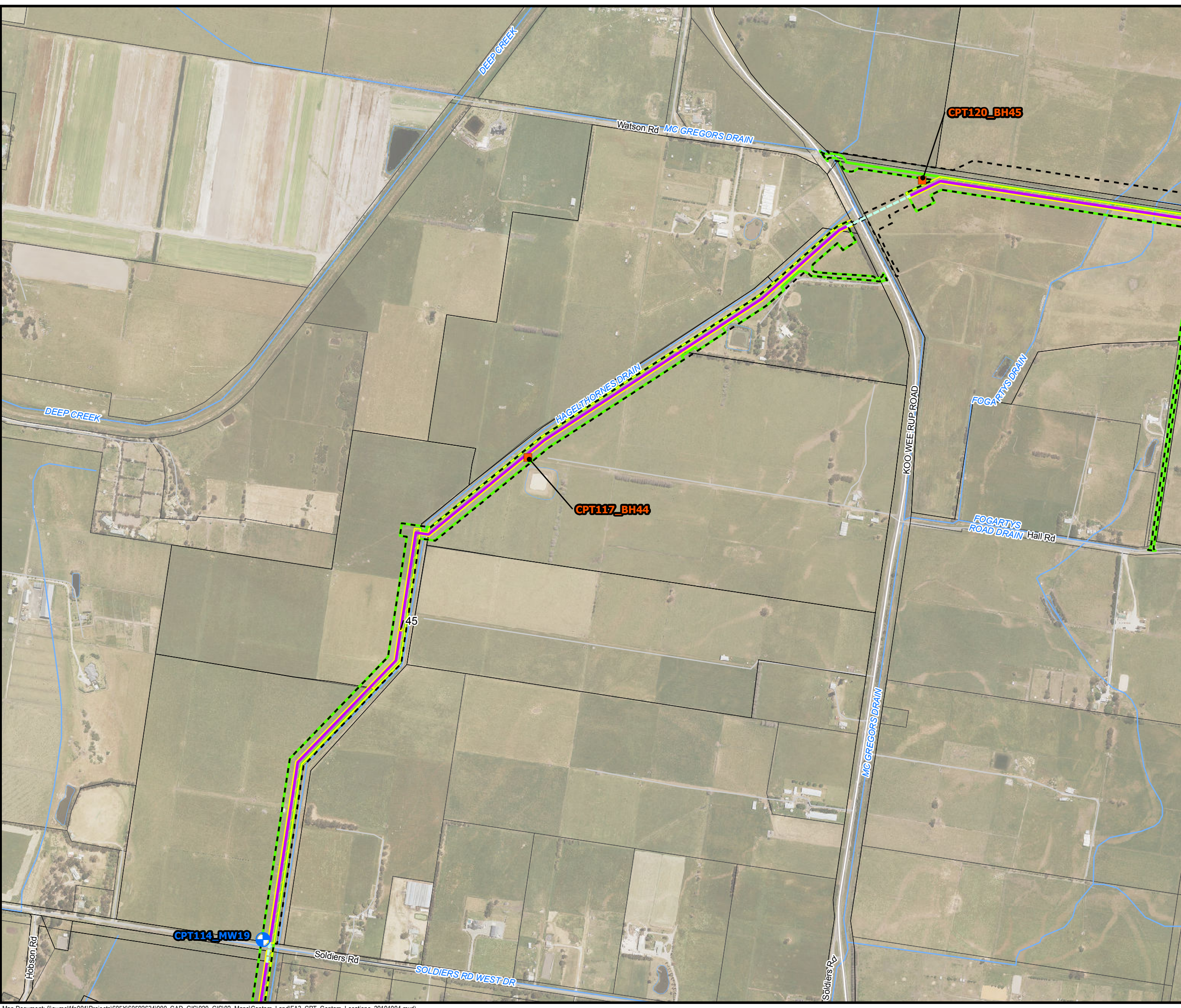
Sampling Locations

Pipeline - Mapsheet 19 (of 23)

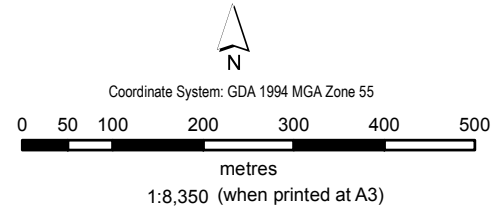
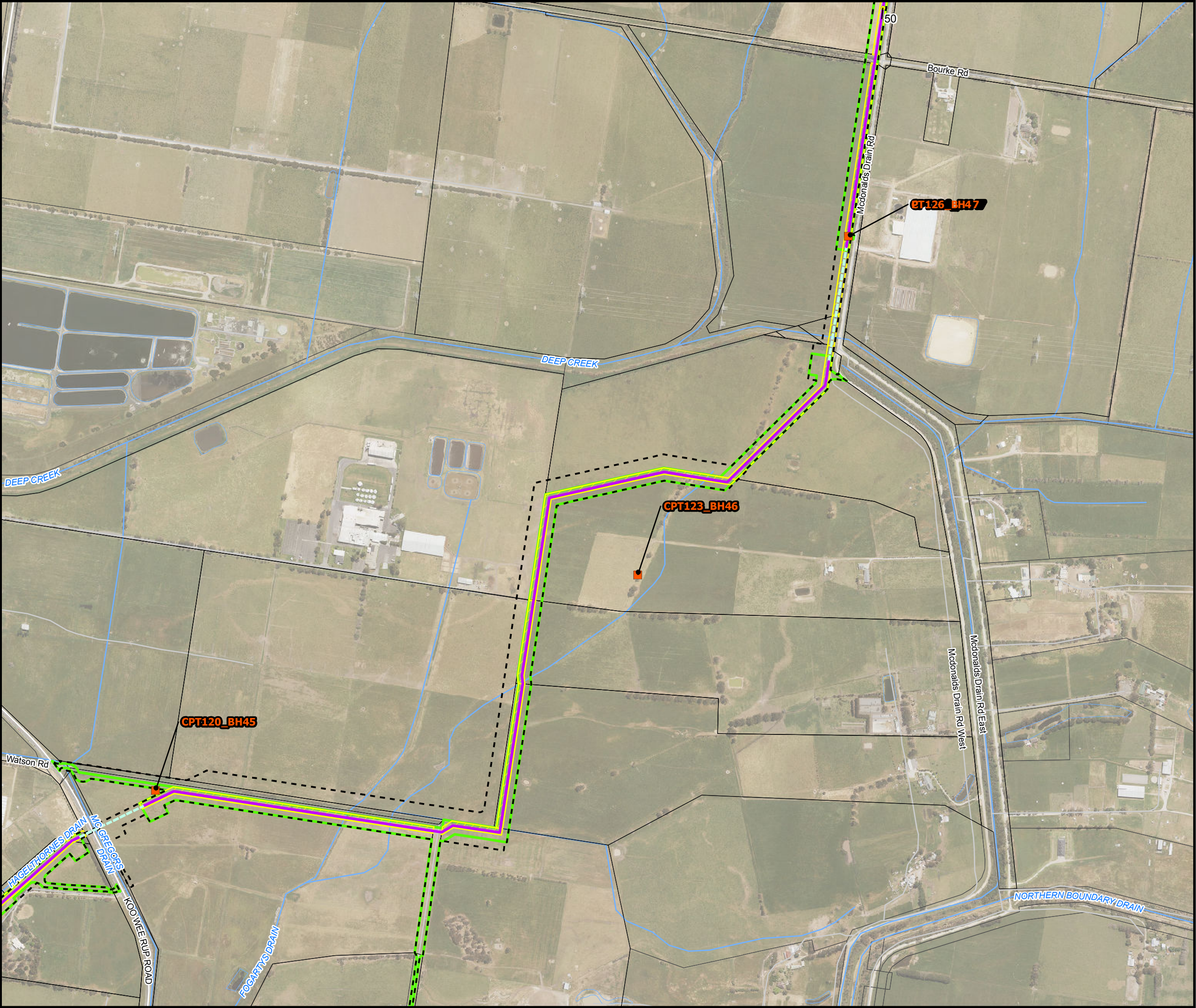
APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure

A3-19

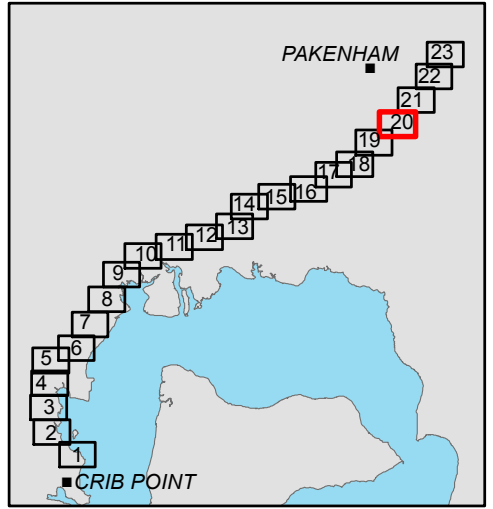


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LEGEND

- Kilometre points
- Grid soil bore
- Open - Cut
- Trenchless
- Total Study Area
- Easement
- Construction Footprint
- Cadastre (adjusted)
- Watercourse
- Waterbody
- Cadastre



Sampling Locations

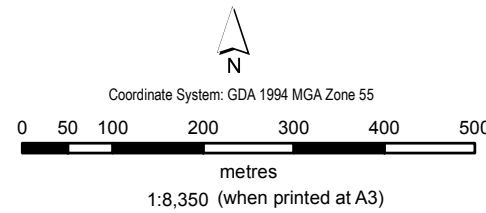
Pipeline - Mapsheet 20 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

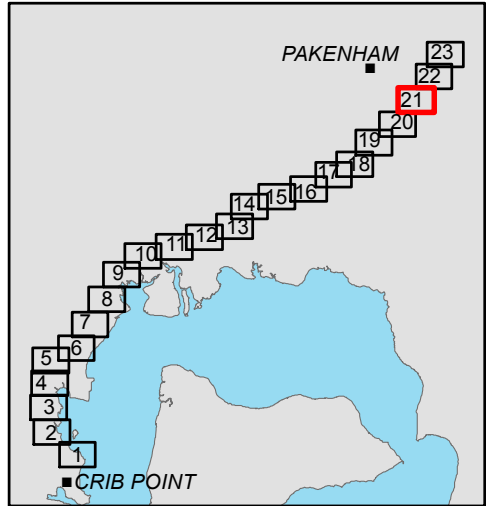
Figure

A3-20

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- LEGEND**
- Kilometre points
 - Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastré (adjusted)
 - Watercourse
 - Waterbody
 - Cadastré

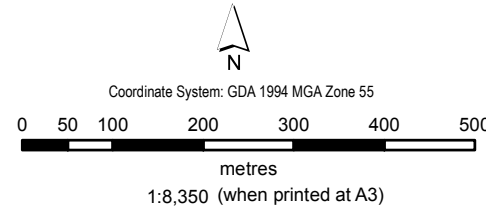
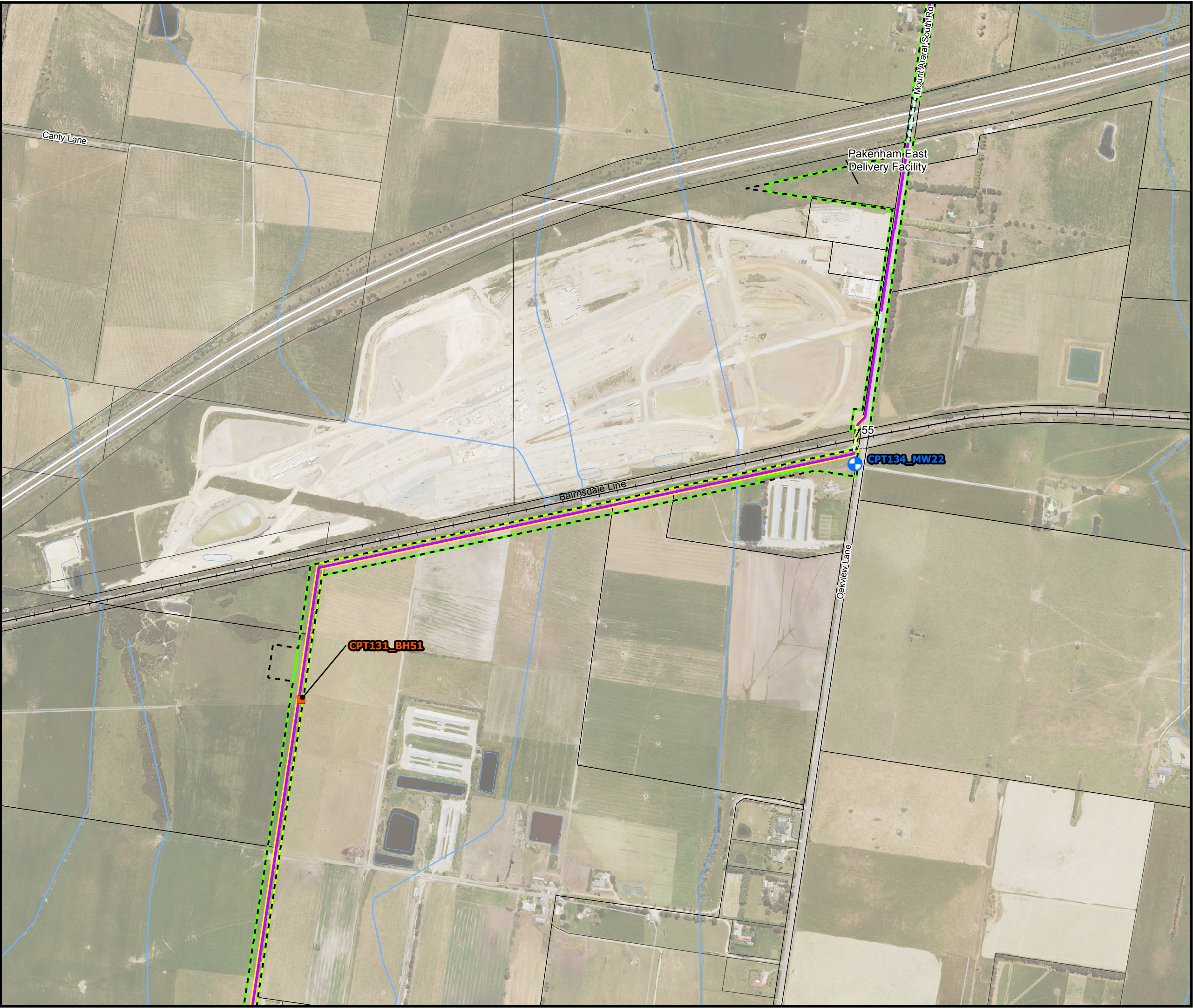


Sampling Locations

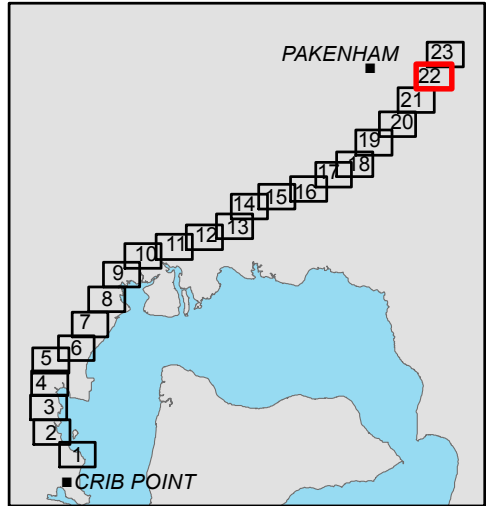
Pipeline - Mapsheet 21 (of 23)

APA Contamination and acid sulfate soils Gas Import Jetty and Pipeline Project Environment Effects Statement	Figure A3-21
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- LEGEND**
- Kilometre points
 - Groundwater monitoring bore
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Easement
 - Construction Footprint
 - Cadastral (adjusted)
 - Rail
 - Watercourse
 - Waterbody
 - Cadastral

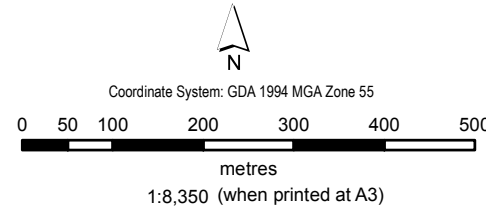


Sampling Locations

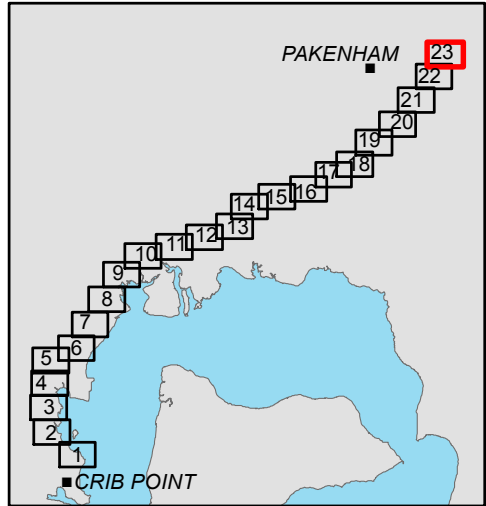
Pipeline - Mapsheet 22 (of 23)

APA Contamination and acid sulfate soils Gas Import Jetty and Pipeline Project Environment Effects Statement	Figure A3-22
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- LEGEND**
- Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Cadastre (adjusted)
 - Watercourse
 - Waterbody
 - Cadastre

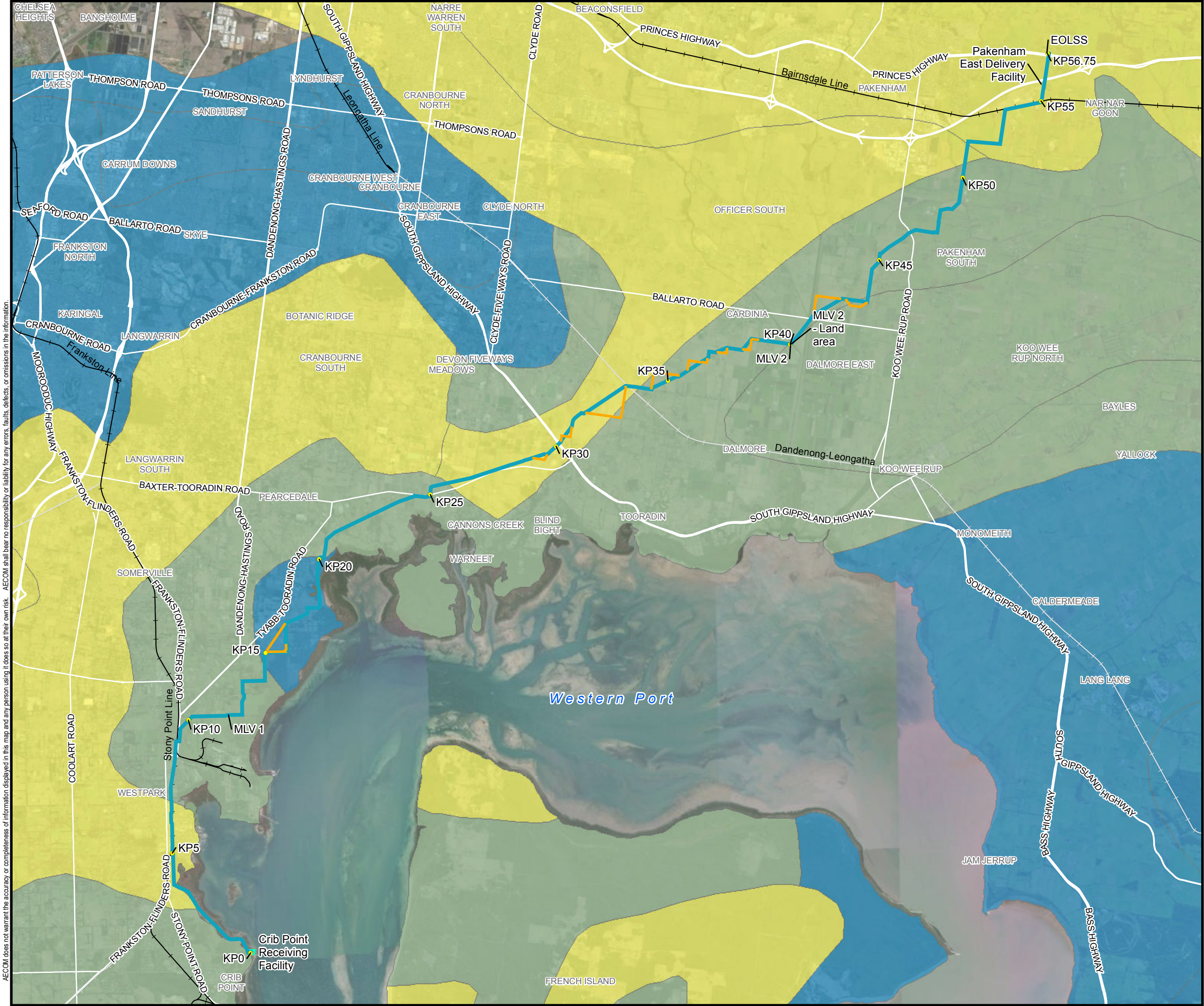


Sampling Locations

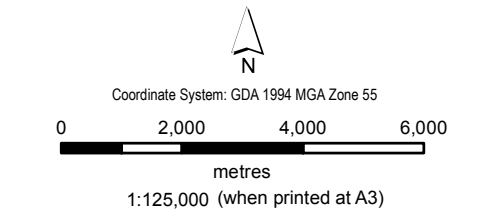
Pipeline - Mapsheet 23 (of 23)

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A3-23



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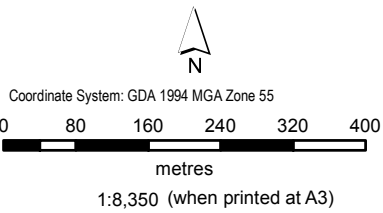
- LEGEND**
- Kilometre points
 - Pipeline
 - Pipeline Alignment Options
- Groundwater Salinity**
- < 1000 mg/L TDS
 - 1000-3000 mg/L TDS
 - 3000-7000 mg/L TDS

Groundwater Salinity

AGL/APL
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A4

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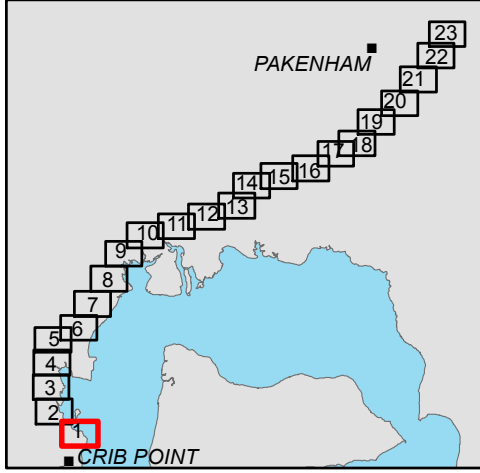
- LEGEND**
- Grid soil bore
 - Targeted soil bore analysed for PFAS
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Crib Point Receiving Facility
 - Construction Footprint
 - Waterbody

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

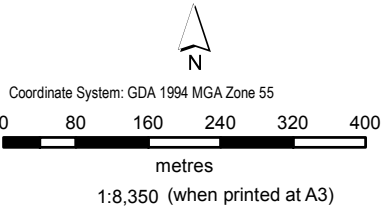
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results - Exceedances Pipeline - Mapsheet 1 (of 23)

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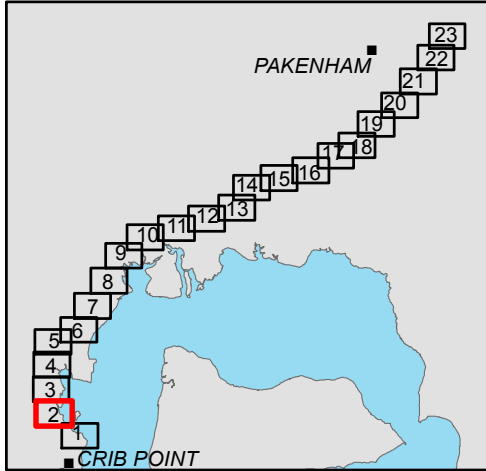
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

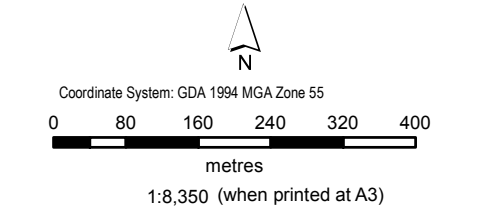
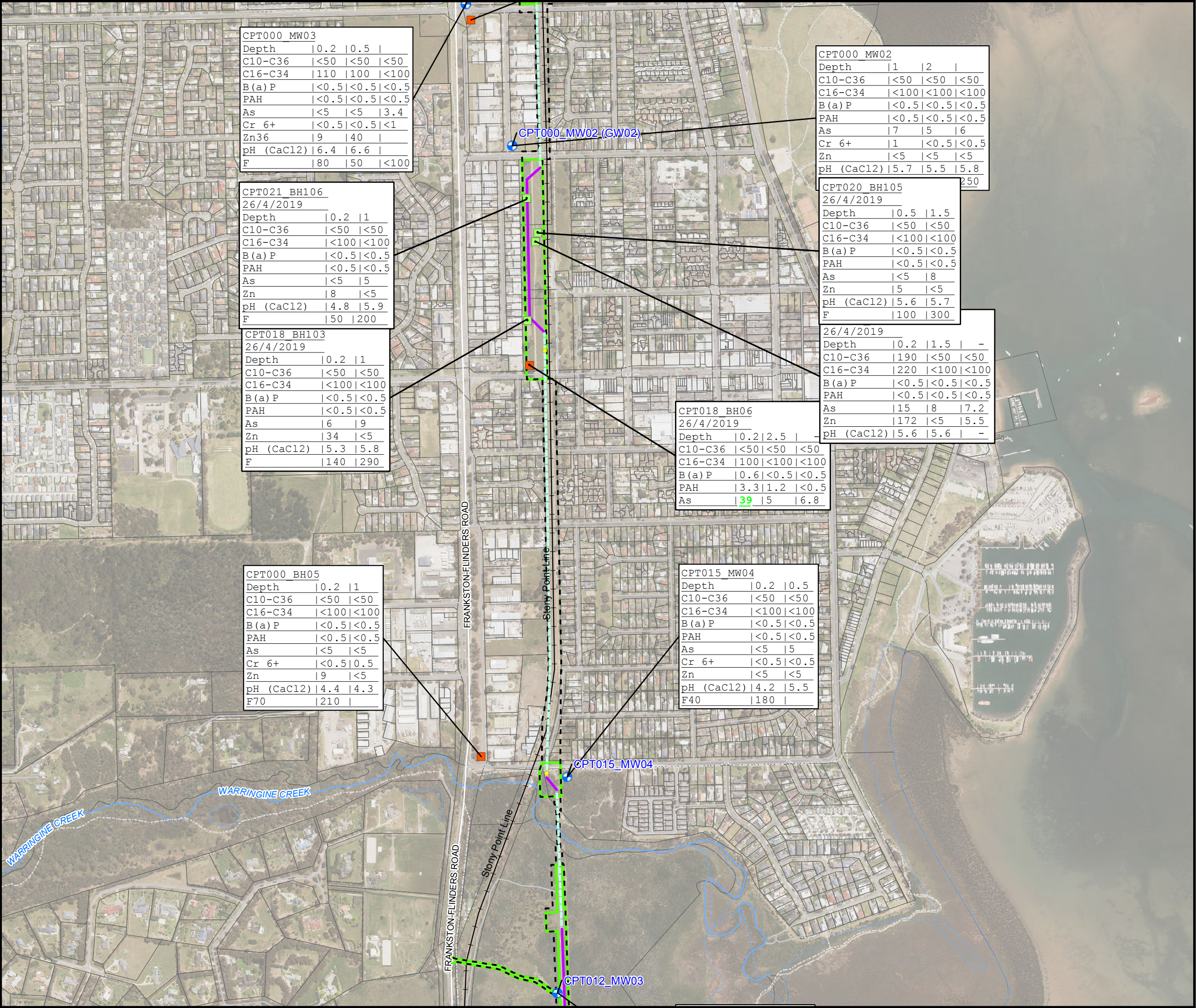
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 2 (of 23)

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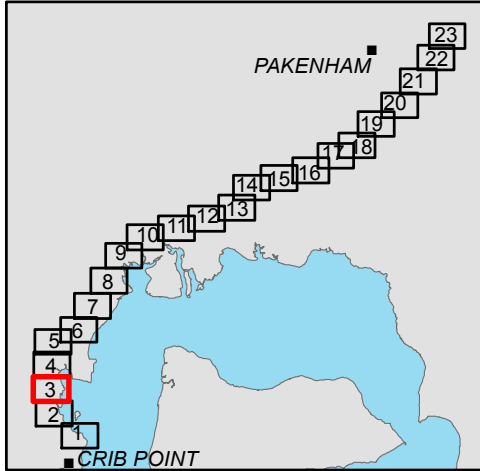
- LEGEND**
- Grid soil bore
 - Targeted soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

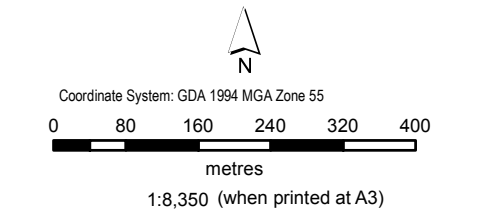
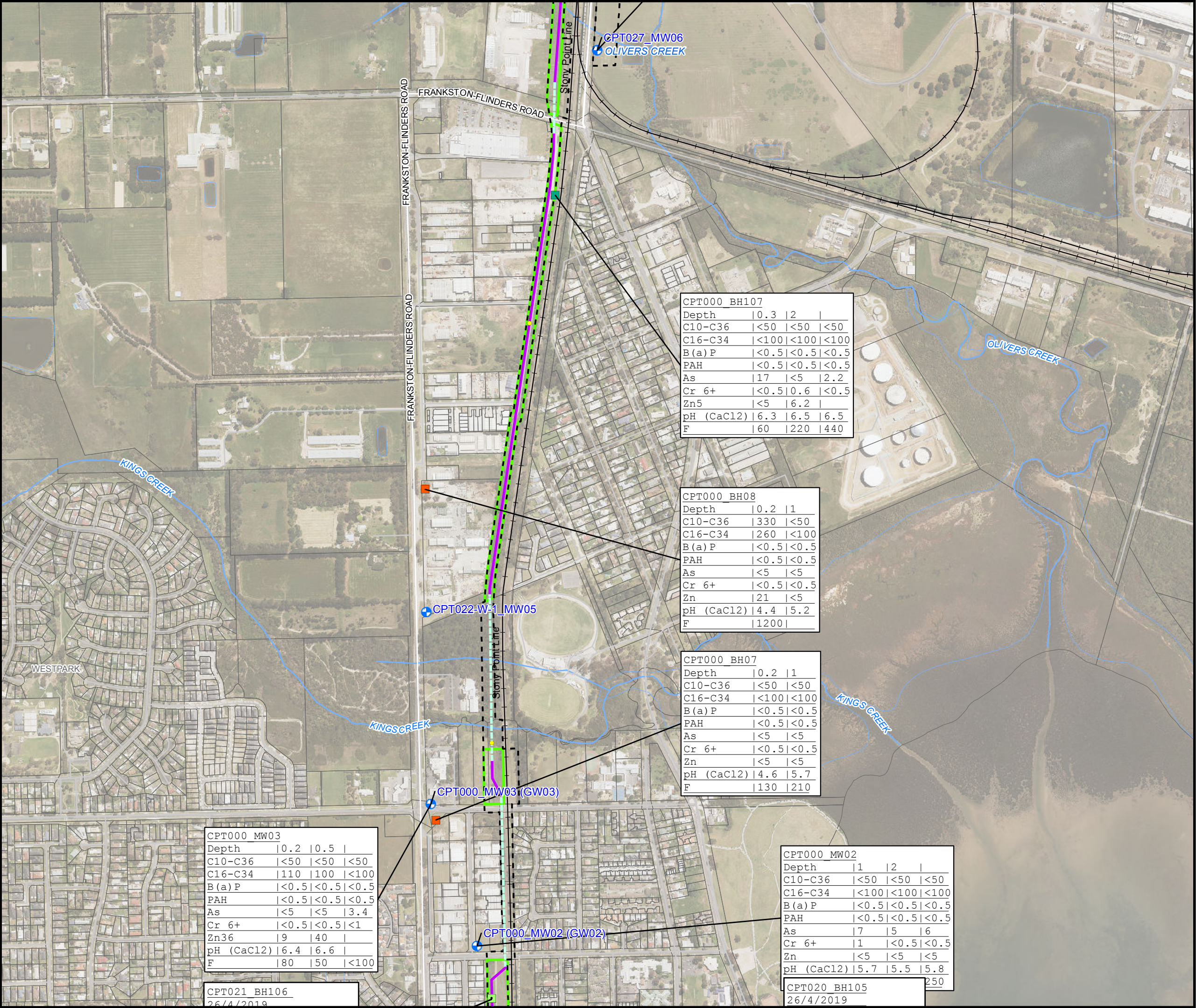
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 3 (of 23)

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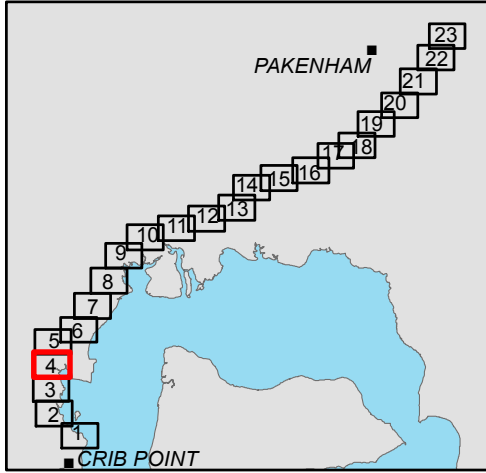
- LEGEND**
- Grid soil bore
 - Targeted soil bore
 - Targeted soil bore analysed for PFAS
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

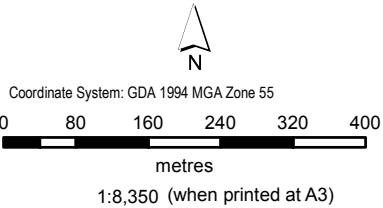
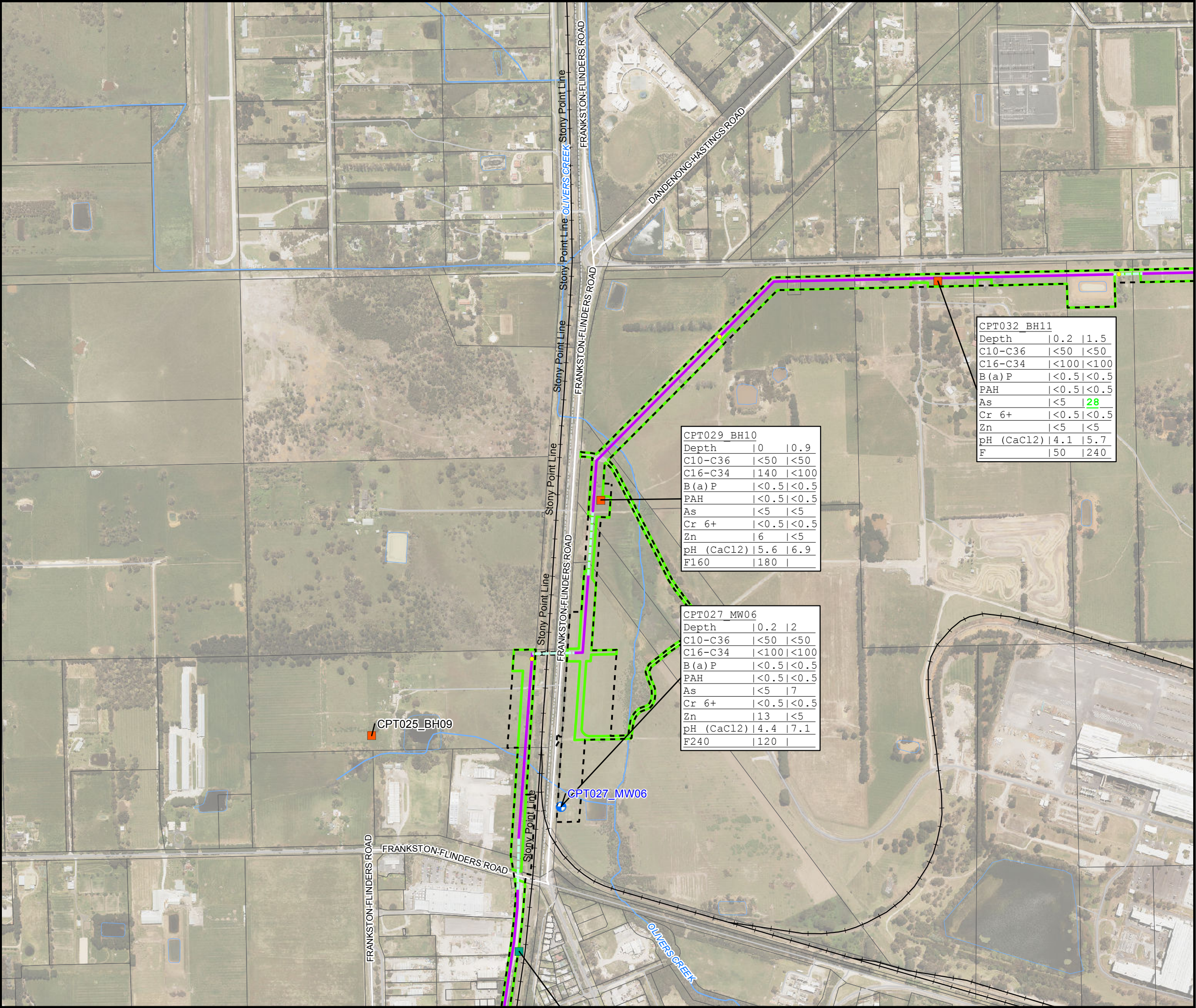
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 4 (of 23)

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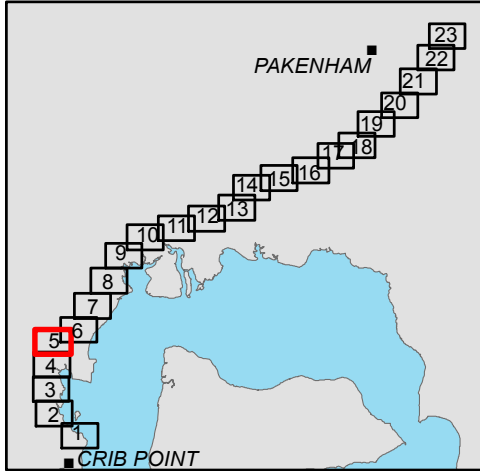
- LEGEND**
- Grid soil bore
 - Targeted soil bore analysed for PFAS
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

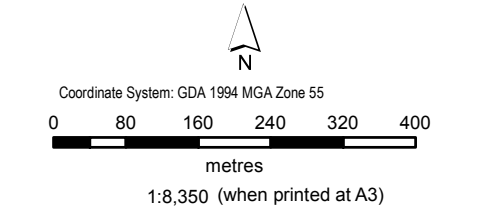
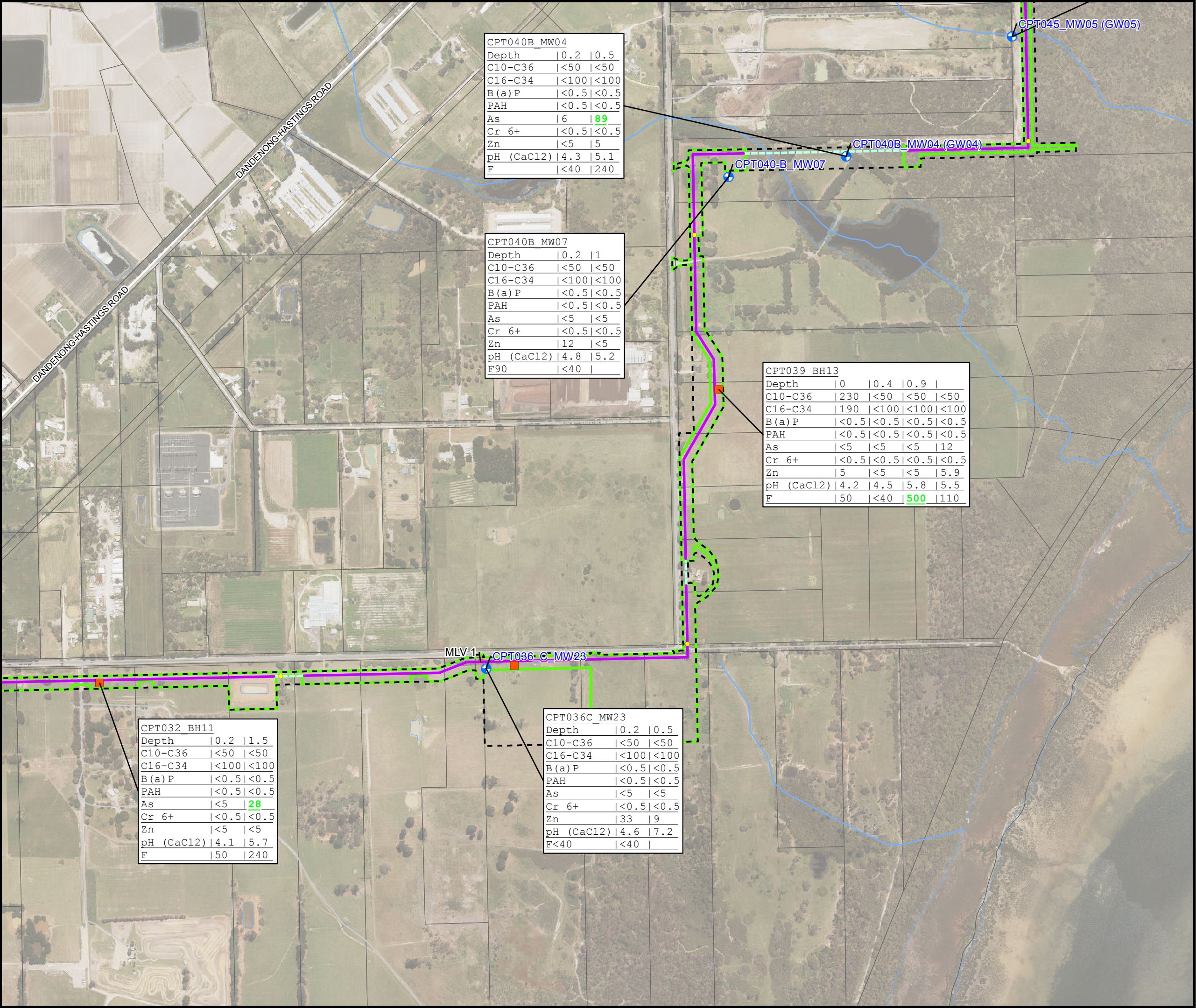
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 5 (of 23)

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- LEGEND
- Grid soil bore

●

Groundwater monitoring bore

●

Kilometre points

—

Open - Cut

—

Trenchless

▭

Total Study Area

▭

MLV 1

▭

Construction Footprint

▭

Waterbody

—

Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons

B(a)P - Benzo[a]pyrene

PAH - Polycyclic Aromatic Hydrocarbons

As - Arsenic

Cr+6 - Chromium (VI)

Zn - Zinc

pH (CaCl2) - pH (Calcium Chloride)

F - Fluoride

< 0.5 - < Limit of Reporting

Guideline Exceedances:

340: Category B Upper Limits

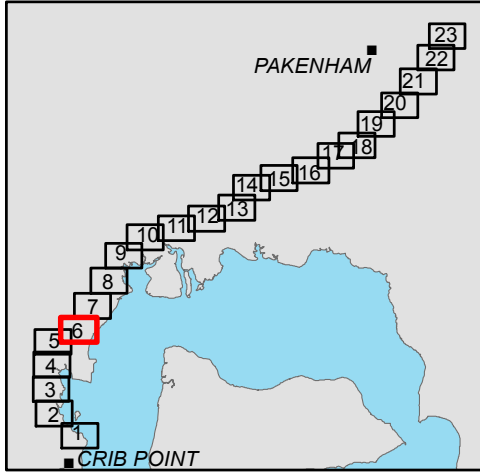
0.04: Category C Upper Limits

507: Fill Material Upper Limits

340 NEPM 2013 Table 1A(1) HILs Res A Soil

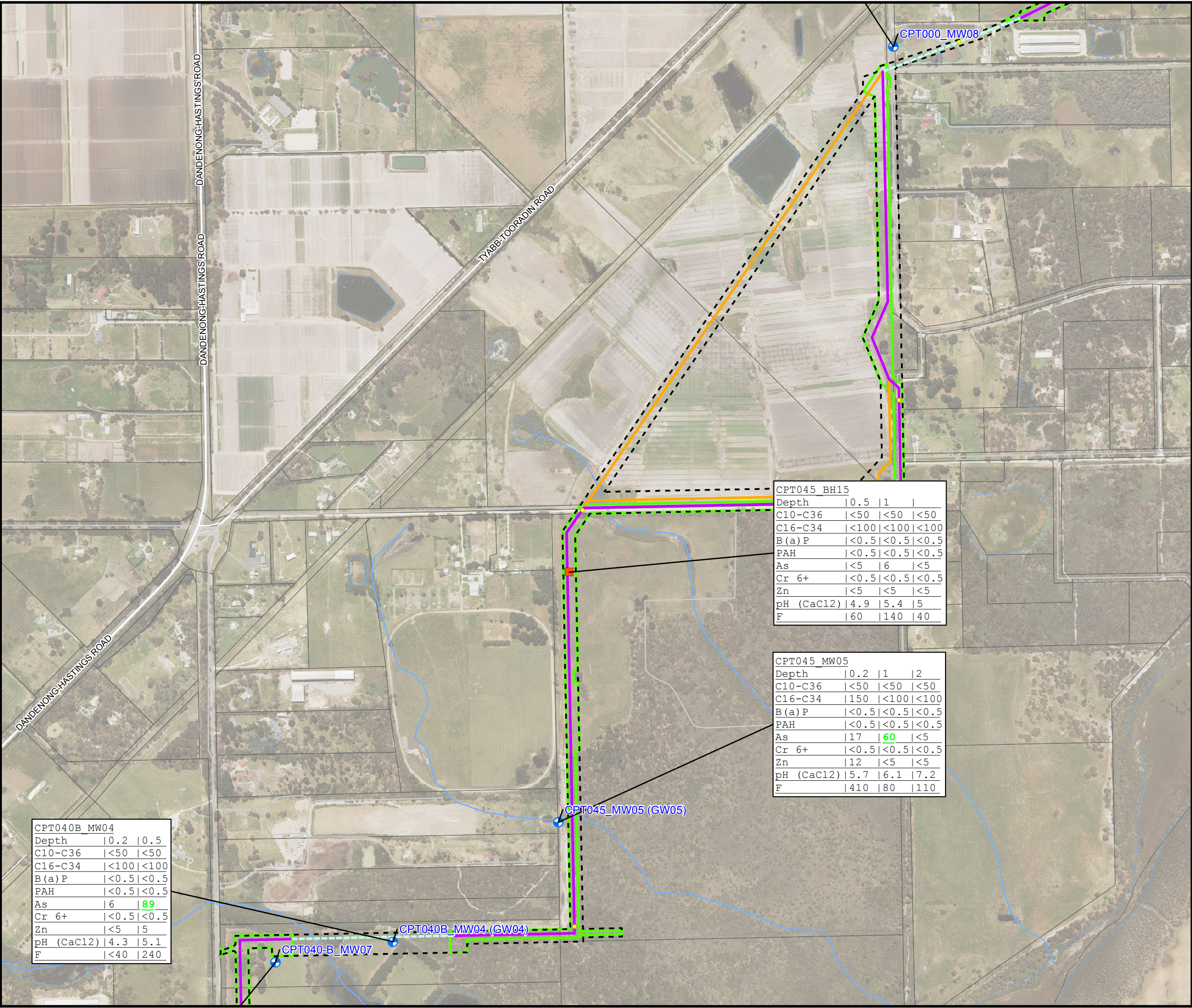
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs

10300: NEP 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 6 (of 23)

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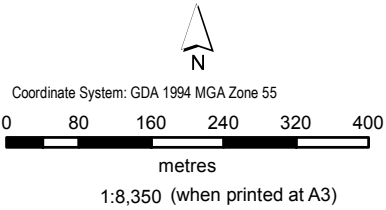
CPT040B_MW04			
Depth	0.2	0.5	
C10-C36	<50	<50	
C16-C34	<100	<100	
B(a)P	<0.5	<0.5	
PAH	<0.5	<0.5	
As	6	89	
Cr 6+	<0.5	<0.5	
Zn	<5	15	
pH (CaCl2)	4.3	5.1	
F	<40	240	

CPT045_BH15			
Depth	0.5	1	
C10-C36	<50	<50	<50
C16-C34	<100	<100	<100
B(a)P	<0.5	<0.5	<0.5
PAH	<0.5	<0.5	<0.5
As	<5	16	<5
Cr 6+	<0.5	<0.5	<0.5
Zn	<5	<5	<5
pH (CaCl2)	4.9	5.4	5
F	160	140	140

CPT045_MW05			
Depth	0.2	1	2
C10-C36	<50	<50	<50
C16-C34	150	<100	<100
B(a)P	<0.5	<0.5	<0.5
PAH	<0.5	<0.5	<0.5
As	17	60	<5
Cr 6+	<0.5	<0.5	<0.5
Zn	12	<5	<5
pH (CaCl2)	5.7	6.1	7.2
F	410	80	110

PROJECT ID 60592634
CREATED BY sam.schroder
LAST MODIFIED sam.schroder 26 MAY 2020

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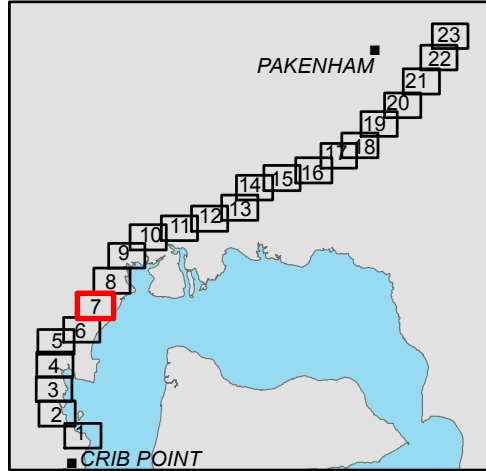
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 7 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Contamination and acid sulfate soils

Crib Point to Pakenham

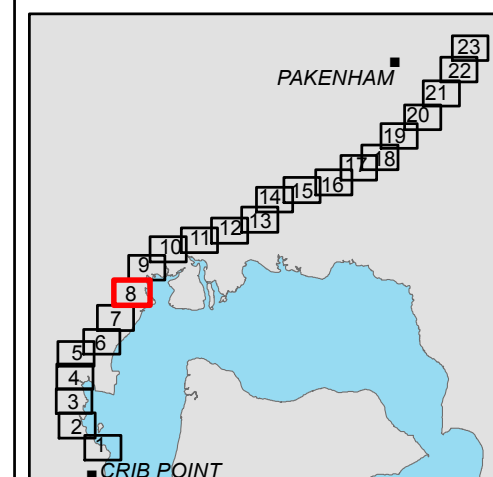
Figure
A5-7



- ### Analytical Results:

Guideline Exceedances:

```
340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEP 2013 Table 1B(6) ESLs for Urban Res, Coarse
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Contaminated soils results – Exceedances
Pipeline - Mapsheet 8 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

Figure
A5-8

CPT055 MW10			
Depth	0.2	2.5	
C10-C36	<50	<50	<50
C16-C34	<100	<100	<100
B(a)P	<0.5	<0.5	<0.5
PAH	<0.5	<0.5	<0.5
As	<5	<5	<5
Cr 6+	<0.5	<0.5	<0.5
Zn	<5	<5	6
pH (CaCl2)	4.2	7.3	7.2
F	50	140	80

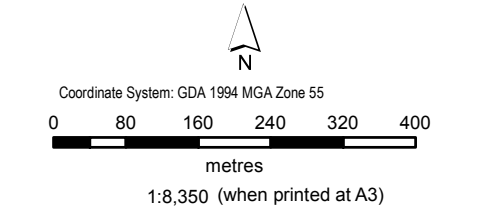
CPT051 MW09		
Depth	0.2	0.5
C10-C36	160	<50
C16-C34	180	<100
B(a)P	<0.5	<0.5
PAH	<0.5	<0.5
As	<5	16
Cr 6+	<0.5	<0.5
Zn	7	<5
pH (CaCl2)	4.7	6.8
F	80	

CPT000 MW08		
Depth	1.5	2
C10-C36	<50	<50
C16-C34	<100	<100
B(a)P	<0.5	<0.5
PAH	<0.5	<0.5
As	<5	<5
Cr 6+	<0.5	<0.5
Zn	<5	<5
pH (CaCl2)	3.6	4.2
F	<40	70

CPT049B BH17		
Depth	0	1
C10-C36	190	<50
C16-C34	230	<100
B(a)P	<0.5	<0.5
PAH	<0.5	<0.5
As	<5	10
Cr 6+	<0.5	<0.5
Zn	22	<5
pH (CaCl2)	5.1	6.4
F	50	

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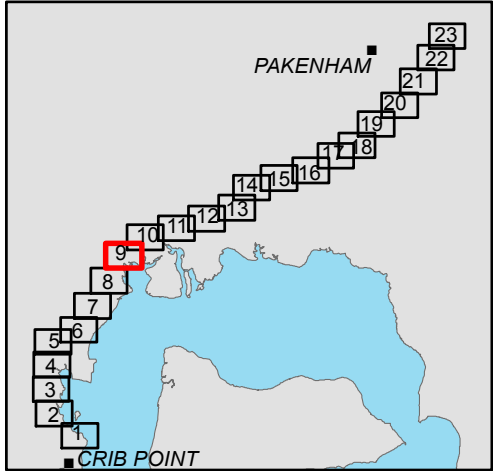
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

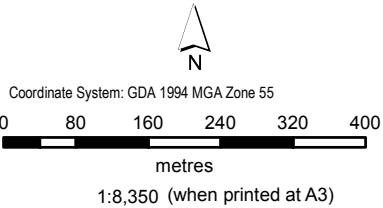
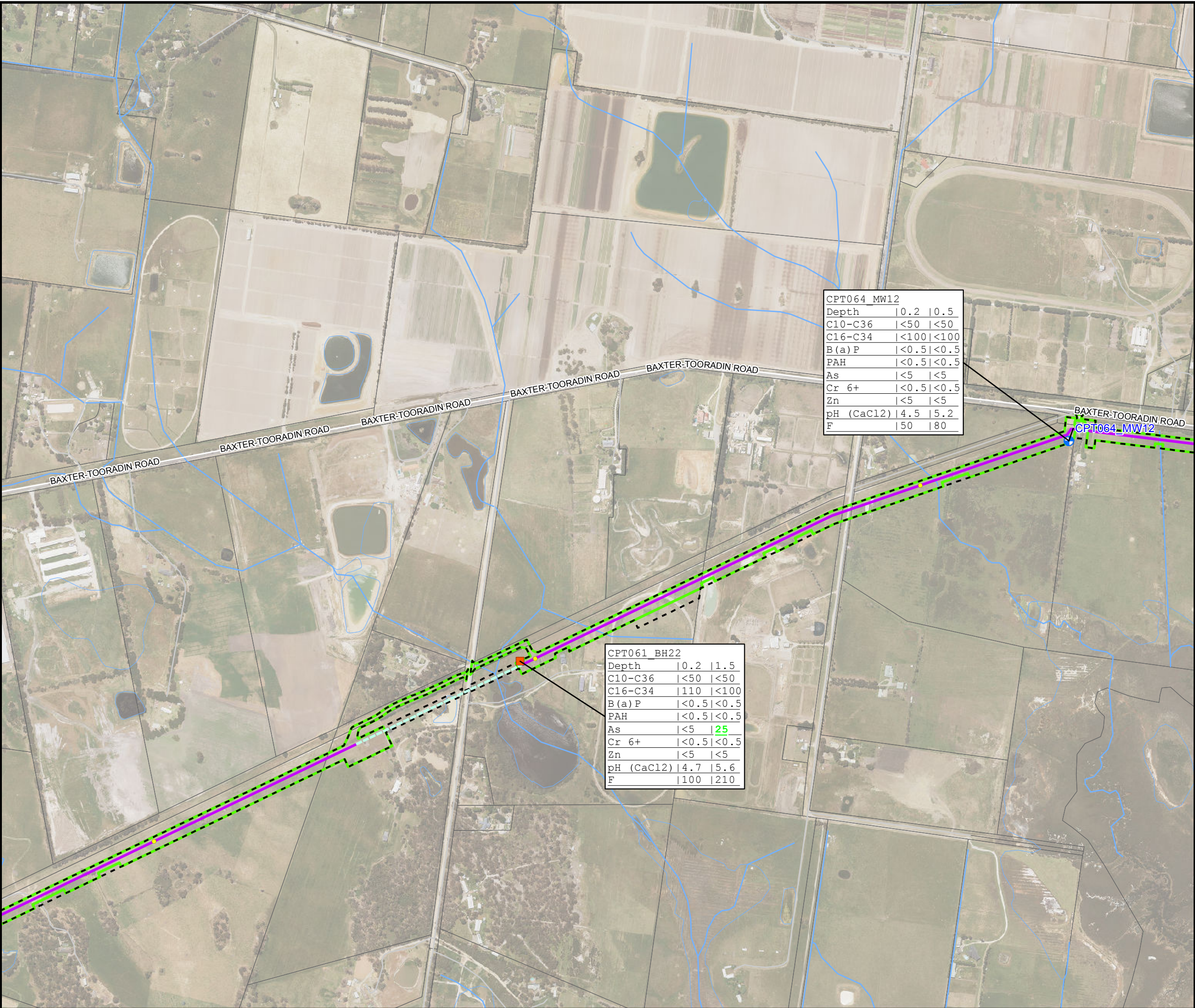
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 9 (of 23)

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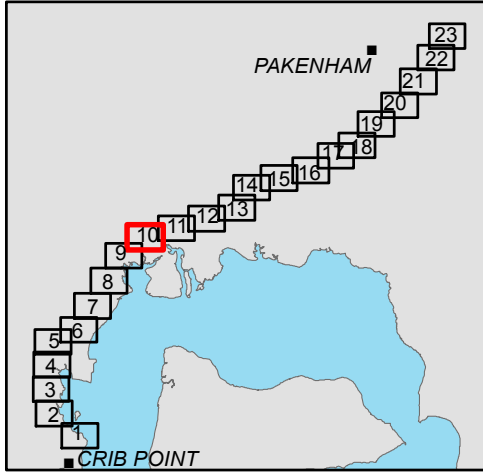
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

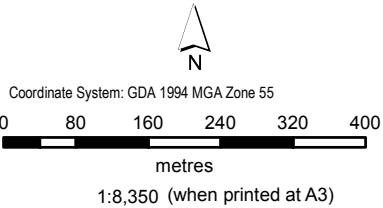
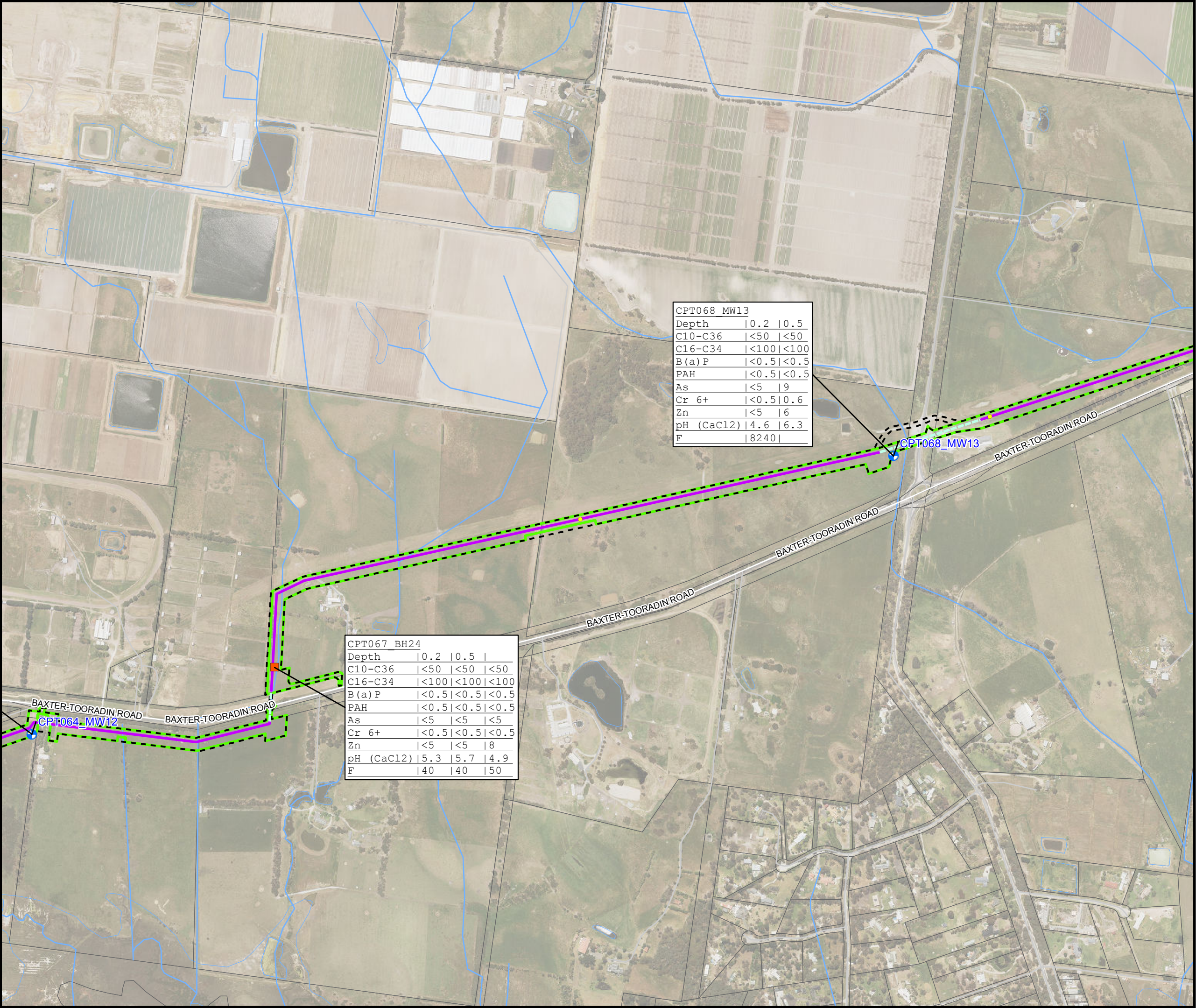
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 10 (of 23)

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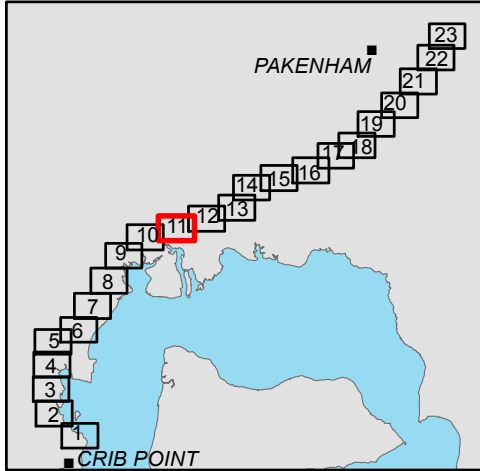
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

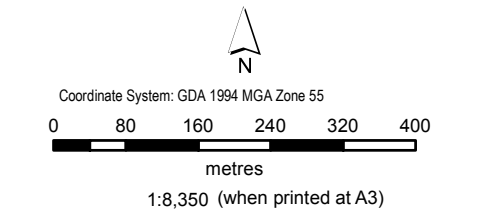
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 11 (of 23)

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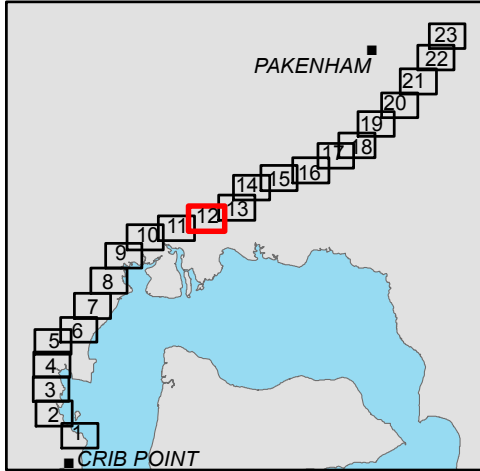
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl₂) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

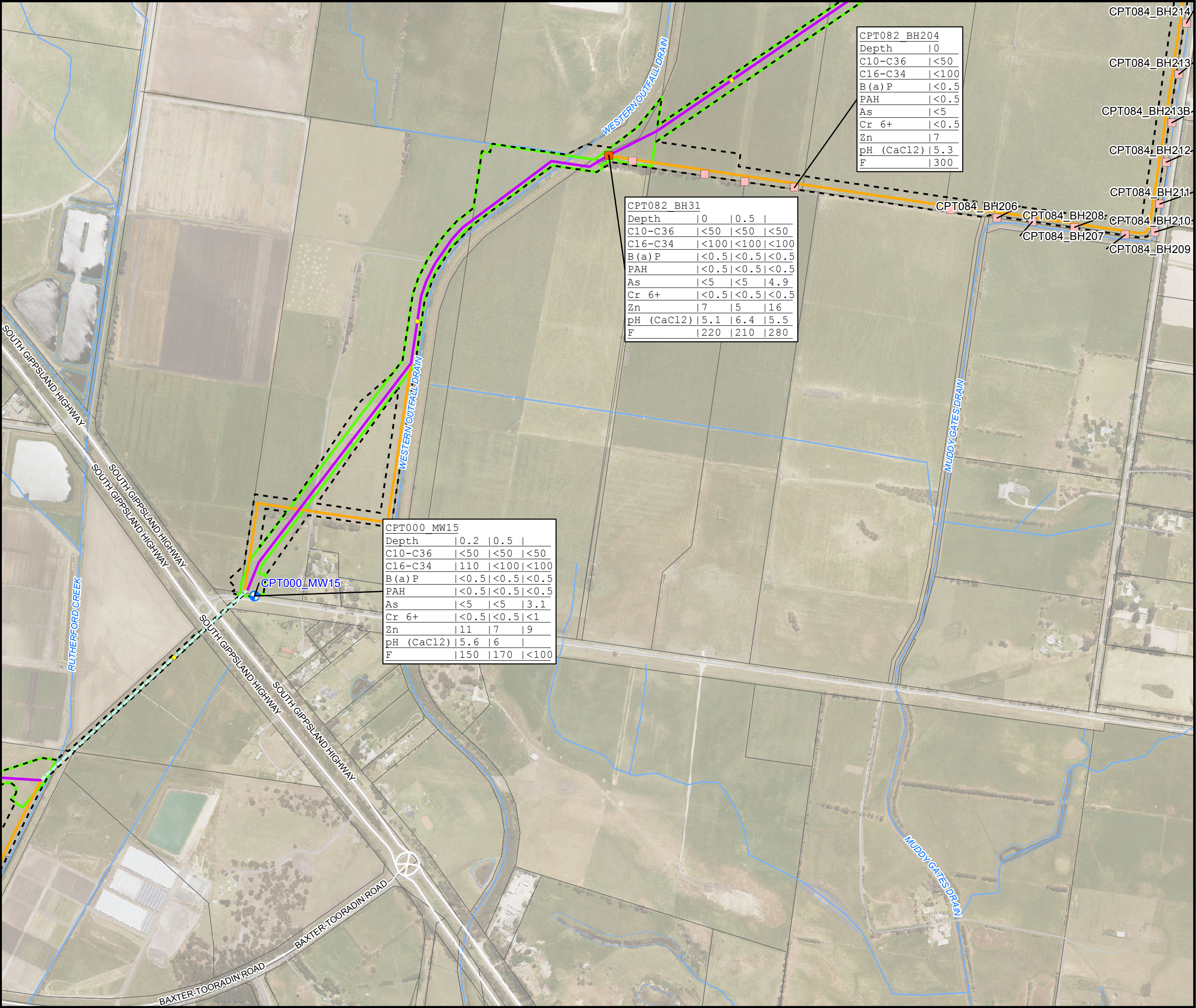
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances
Pipeline - Mapsheet 12 (of 23)

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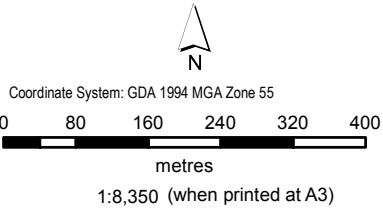


CPT082_BH204	
Depth	0
C10-C36	<50
C16-C34	<100
B(a)P	<0.5
PAH	<0.5
As	<5
Cr 6+	<0.5
Zn	7
pH (CaCl2)	5.3
F	300

CPT082_BH31			
Depth	0	0.5	
C10-C36	<50	<50	<50
C16-C34	<100	<100	<100
B(a)P	<0.5	<0.5	<0.5
PAH	<0.5	<0.5	<0.5
As	<5	<5	4.9
Cr 6+	<0.5	<0.5	<0.5
Zn	7	5	16
pH (CaCl2)	5.1	6.4	5.5
F	220	210	280

CPT000_MW15			
Depth	0.2	0.5	
C10-C36	<50	<50	<50
C16-C34	110	<100	<100
B(a)P	<0.5	<0.5	<0.5
PAH	<0.5	<0.5	<0.5
As	<5	<5	3.1
Cr 6+	<0.5	<0.5	<1
Zn	11	7	9
pH (CaCl2)	5.6	6	
F	150	170	<100

PROJECT ID 60592634
CREATED BY sam.schroder
LAST MODIFIED sam.schroder 26 MAY 2020
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- LEGEND**
- Grid soil bore
 - Targeted acid sulfate soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

Guideline Exceedances:

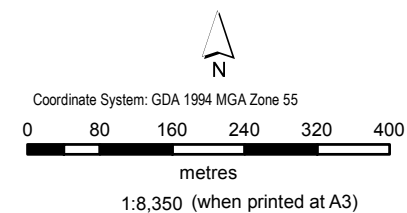
340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 13 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

Figure
A5-13



LEGEND

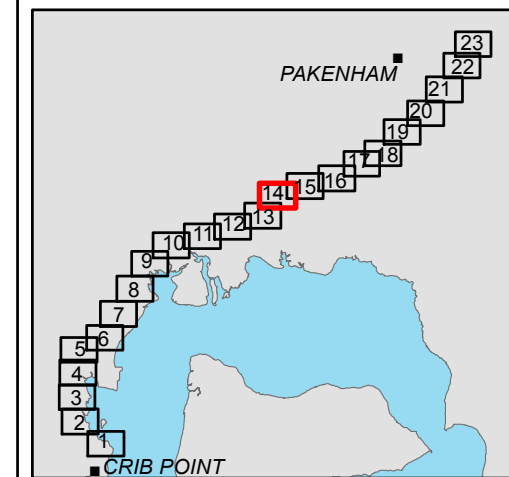
- Grid soil bore
- Targeted acid sulfate soil bore
- Groundwater monitoring bore
- Kilometre points
- Open - Cut
- Trenchless
- Pipeline Alignment Options
- Total Study
- Construction Footprint
- Waterbody
- Watercourse
- Rail disused/ dismantled/ rail trail

Analytical Results:

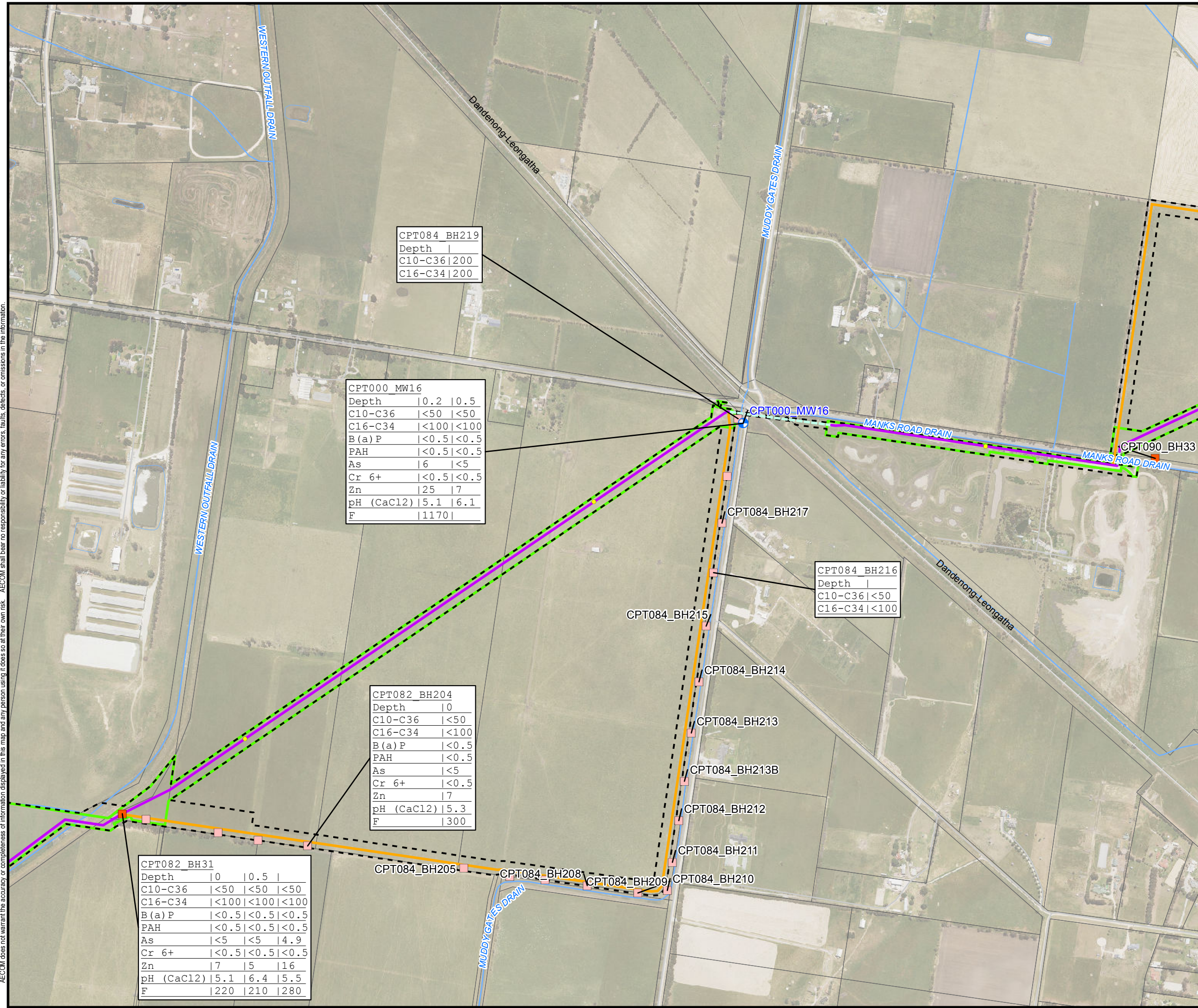
C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse

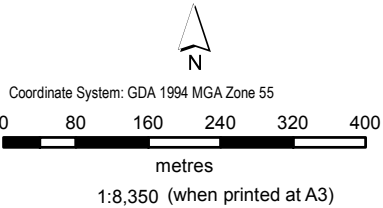
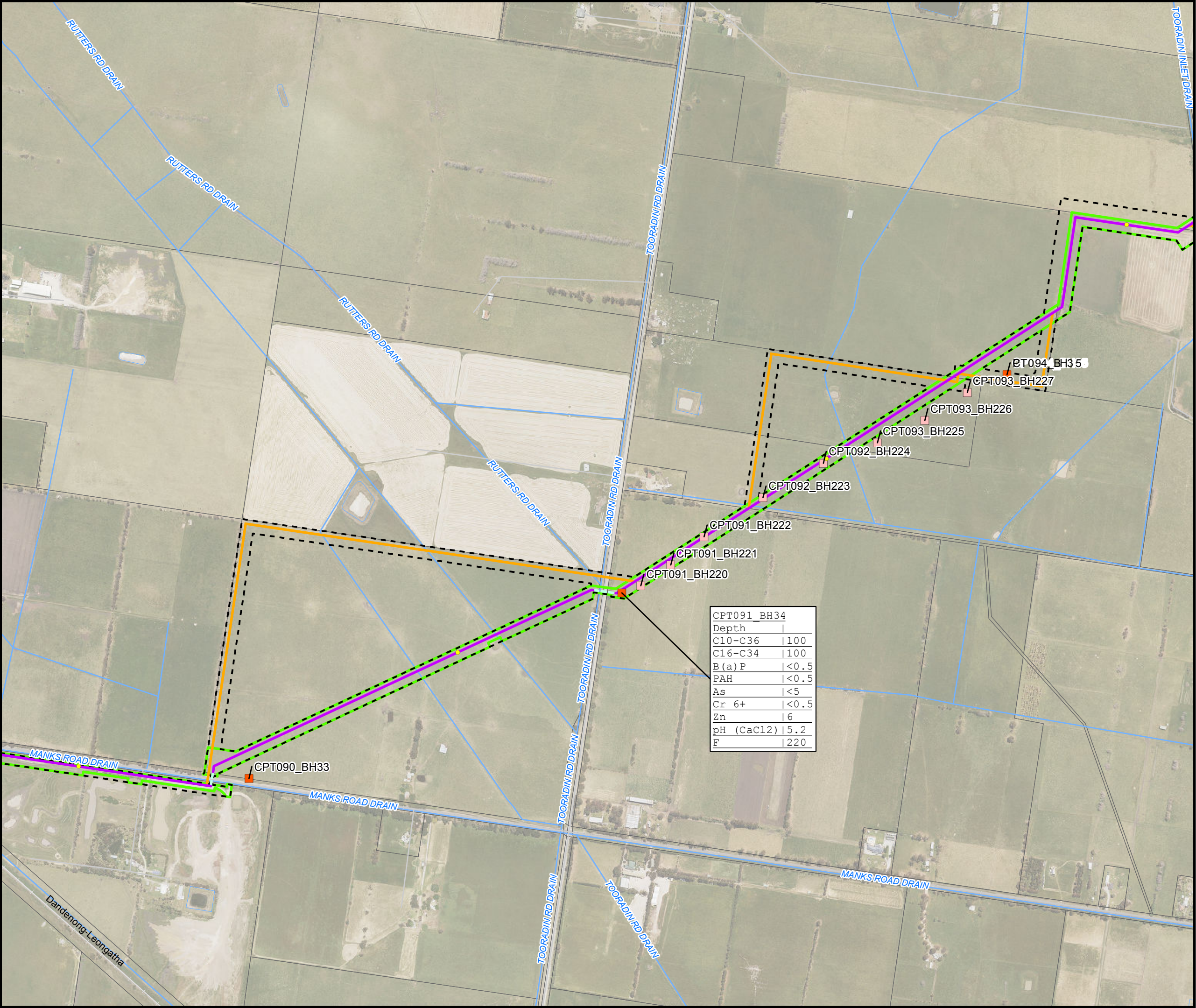


Contaminated soils results – Exceedances Pipeline - Mapsheet 14 (of 23)



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- LEGEND**
- Grid soil bore
 - Targeted acid sulfate soil bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail disused/ dismantled/ rail trail

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

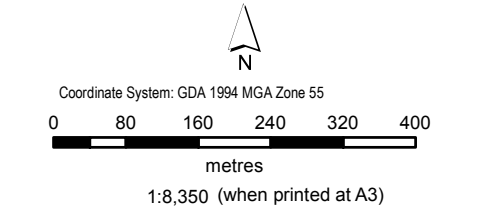
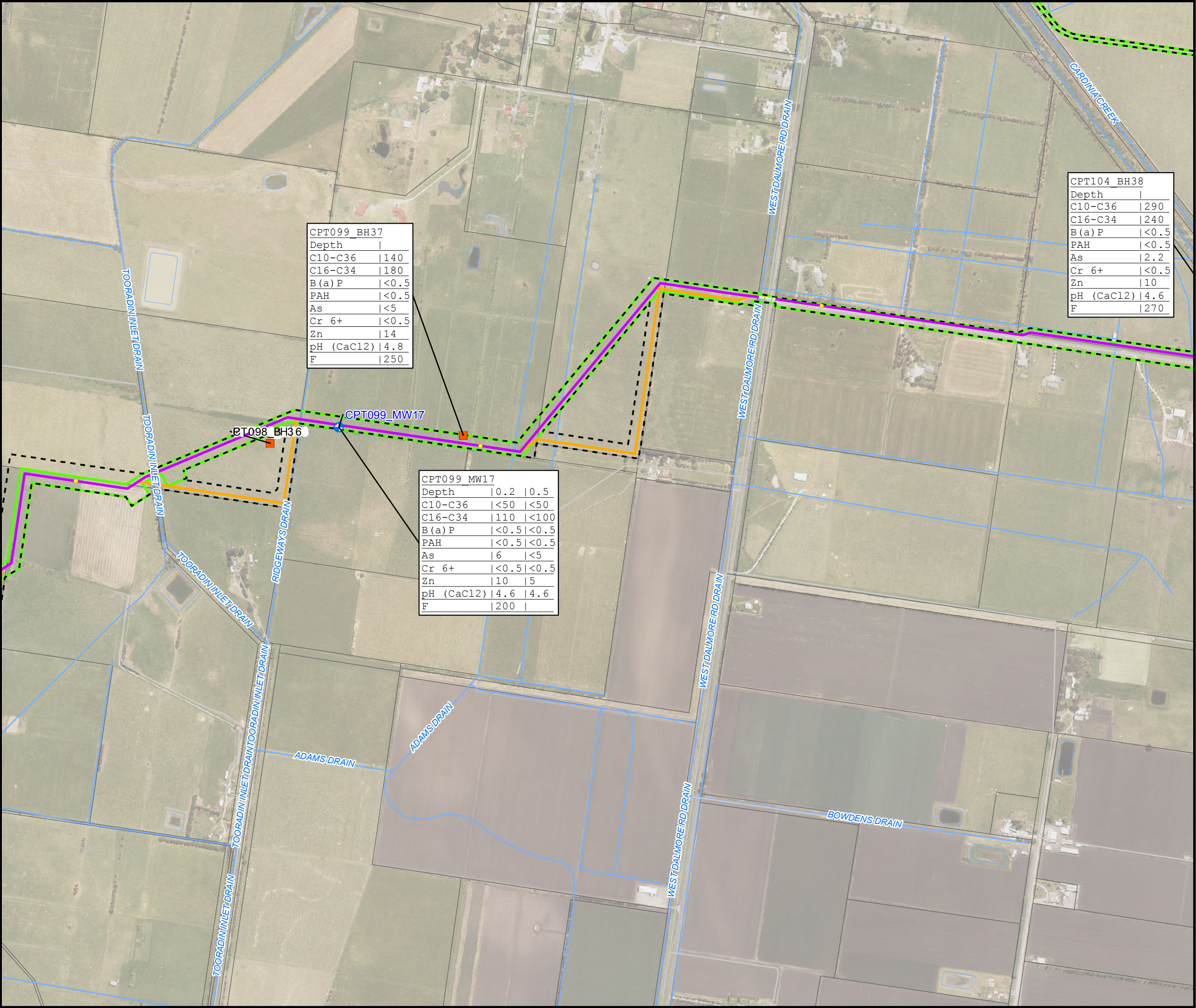
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances
Pipeline - Mapsheet 15 (of 23)

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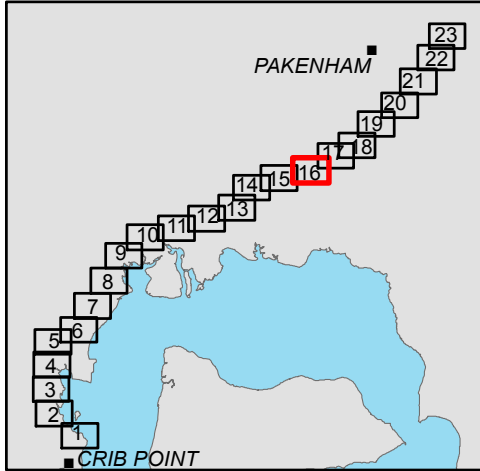
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

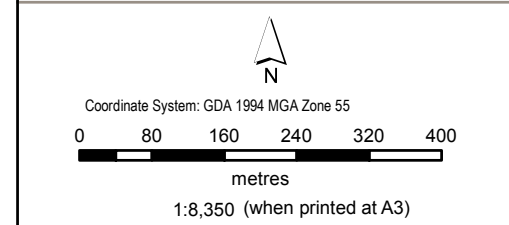
C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 16 (of 23)



- LEGEND
- Grid soil bore

●

Groundwater monitoring bore

●

Kilometre points

—

Open - Cut

—

Trenchless

—

Pipeline Alignment Options

⬜

Total Study Area

⬜

MLV 2

⬜

MLV 2 - Land area

⬜

Construction Footprint

⬜

Waterbody

—

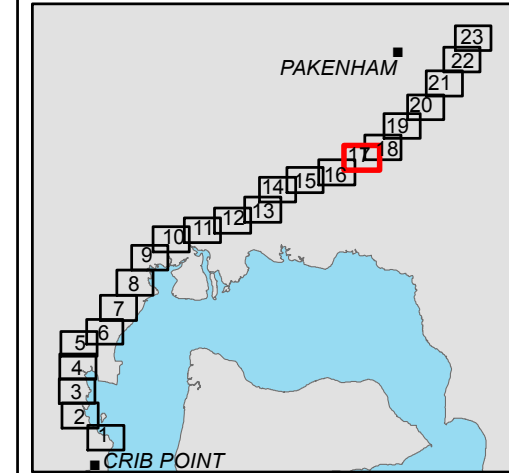
Watercourse

Analytical Results:

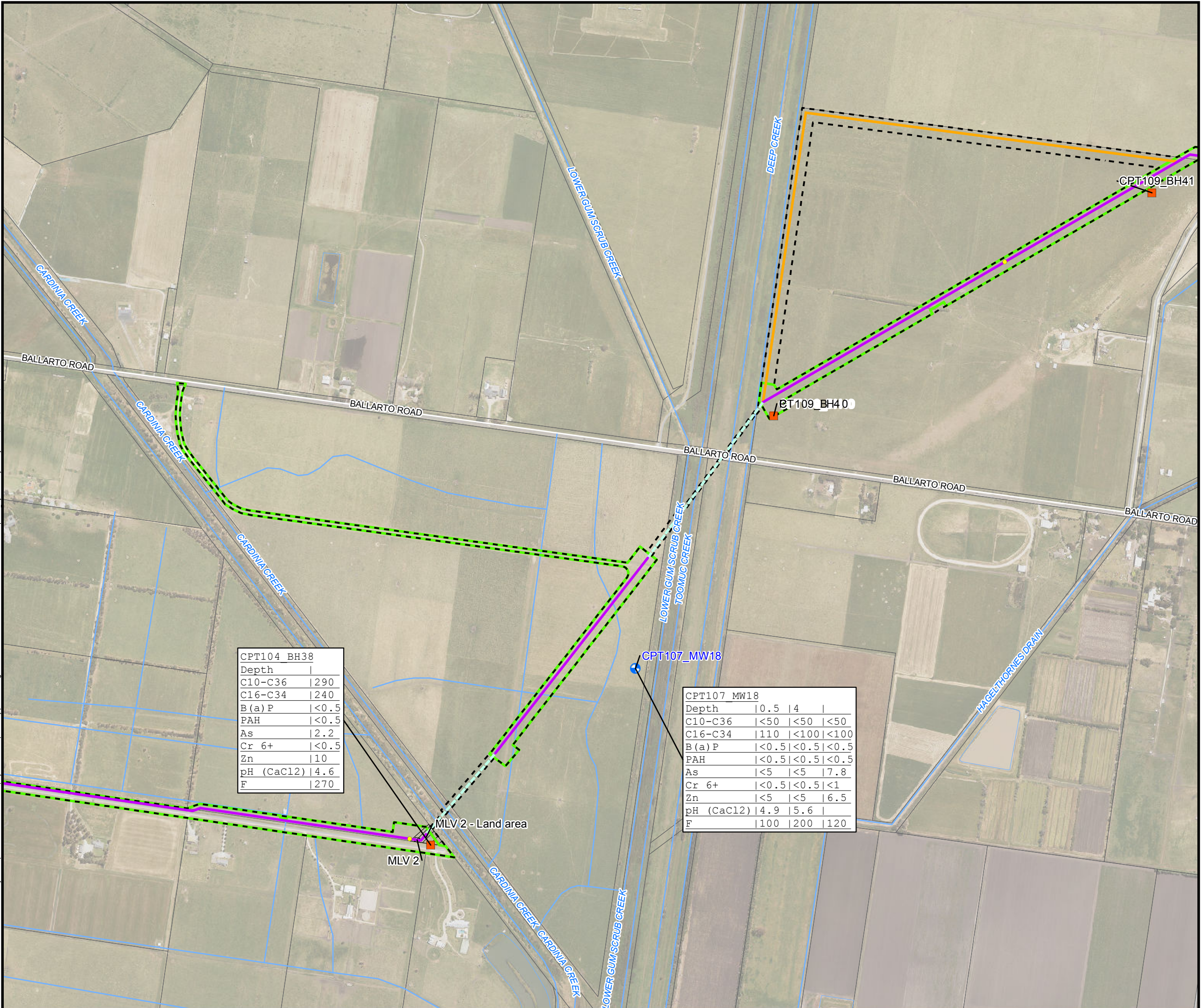
C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

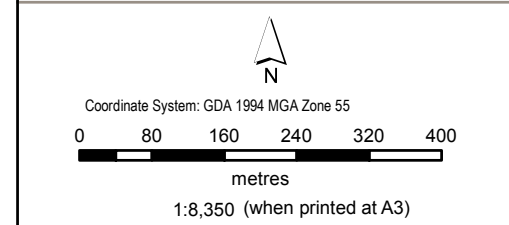
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 17 (of 23)





- LEGEND**
- Grid soil bore

Groundwater monitoring bore

Kilometre points

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

Waterbody

Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons

B(a)P - Benzo[a]pyrene

PAH - Polycyclic Aromatic Hydrocarbons

As - Arsenic

Cr+6 - Chromium (VI)

Zn - Zinc

pH (CaCl2) - pH (Calcium Chloride)

F - Fluoride

< 0.5 - < Limit of Reporting

Guideline Exceedances:

340: Category B Upper Limits

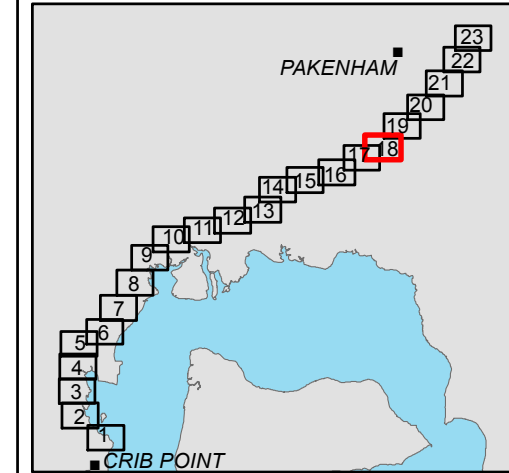
0.04: Category C Upper Limits

507: Fill Material Upper Limits

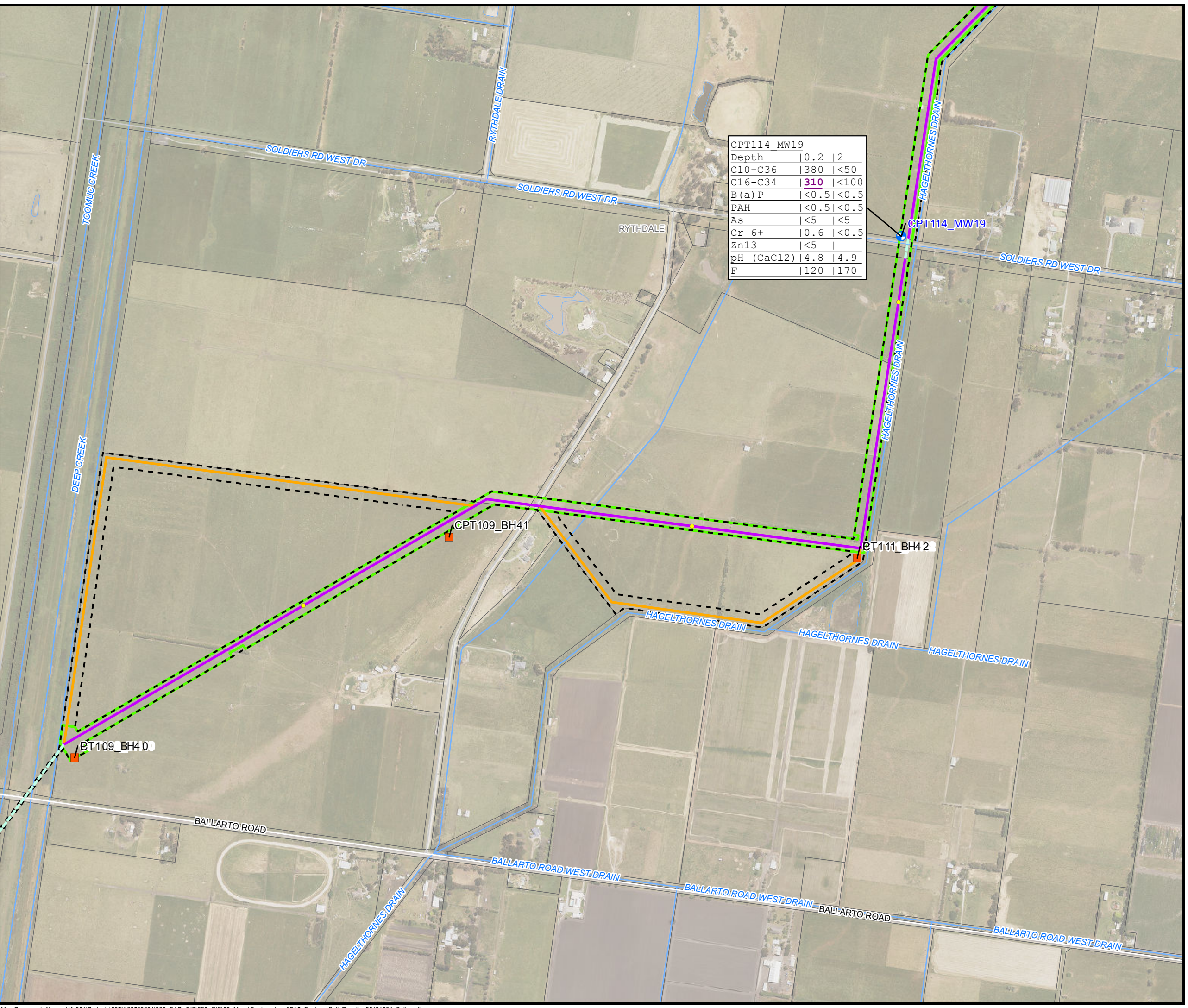
340 NEPM 2013 Table 1A(1) HILs Res A Soil

0.04: NEPM 2013 Table 1B(1-5) Site specific EILs

10300: NEP 2013 Table 1B(6) ESLs for Urban Res, Coarse

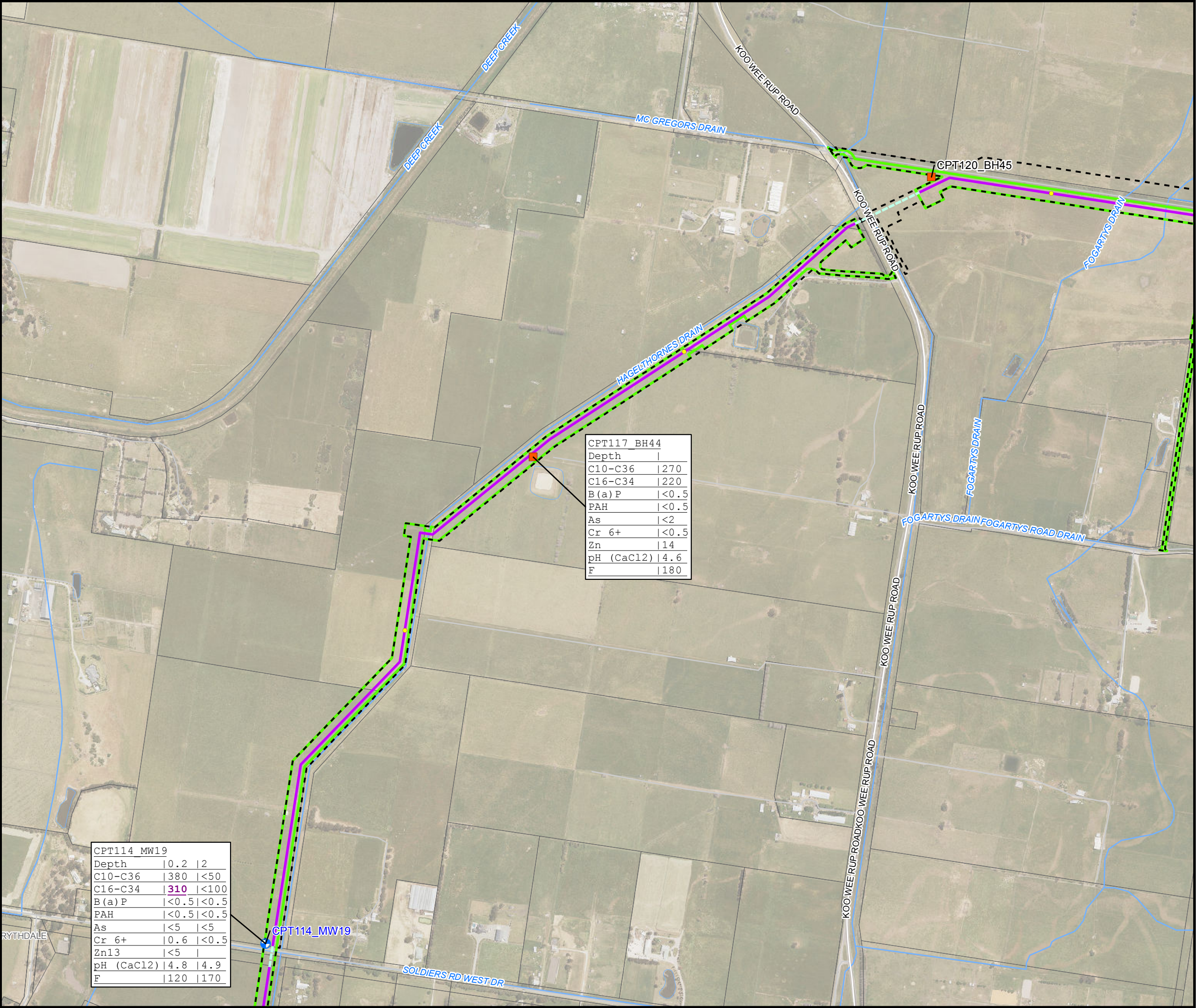


Contaminated soils results – Exceedances Pipeline - Mapsheet 18 (of 23)



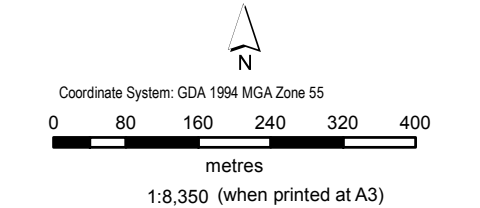
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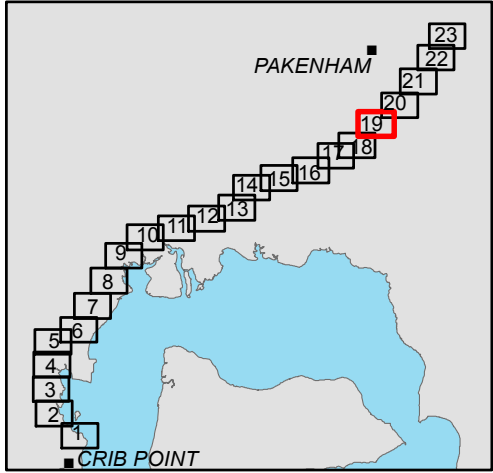
CPT114_MW19			
Depth		0.2	2
C10-C36		380	<50
C16-C34		310	<100
B(a)P		<0.5	<0.5
PAH		<0.5	<0.5
As		<5	<5
Cr 6+		0.6	<0.5
Zn13		<5	
pH (CaCl2)		4.8	4.9
F		120	170

CPT117_BH44			
Depth			
C10-C36		270	
C16-C34		220	
B(a)P		<0.5	
PAH		<0.5	
As		<2	
Cr 6+		<0.5	
Zn		14	
pH (CaCl2)		4.6	
F		180	

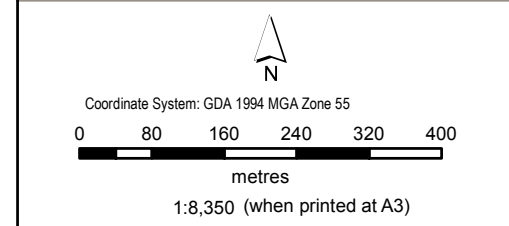


- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

- Analytical Results:**
- C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting
- Guideline Exceedances:**
- 340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 19 (of 23)



- LEGEND
- Grid soil bore

Kilometre points

Open - Cut

Trenchless

Total Study Area

Construction Footprint

Waterbody

Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

Guideline Exceedances:

340

: Category B Upper Limits

0.04

: Category C Upper Limits

507

: Fill Material Upper Limits

340

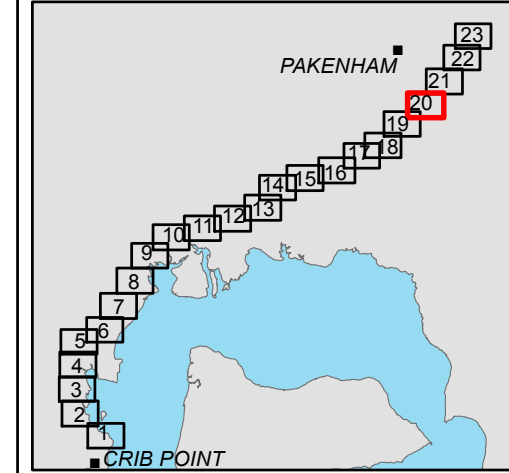
 NEPM 2013 Table 1A(1) HILs Res A Soil

0.04

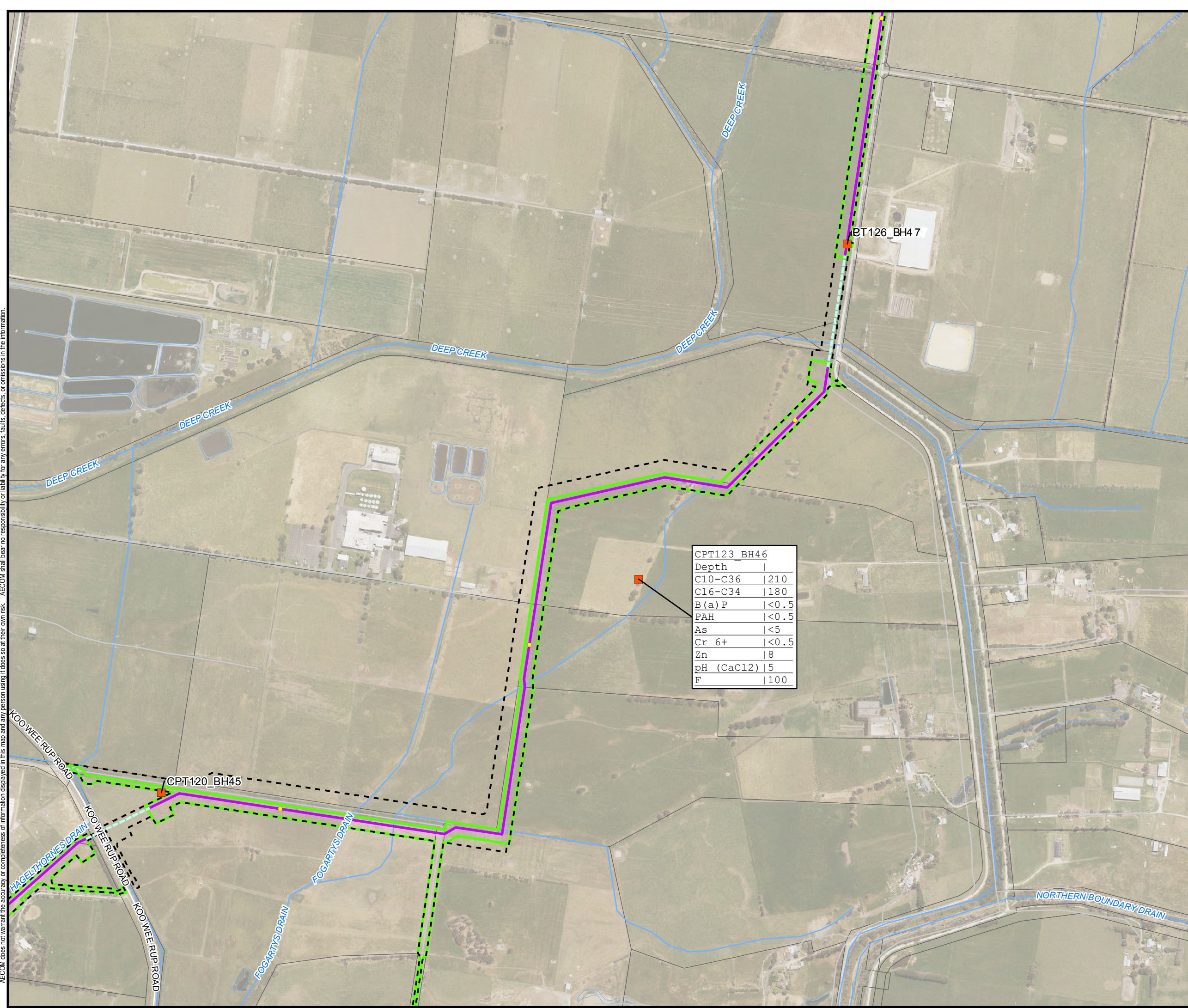
: NEPM 2013 Table 1B(1-5) Site specific EILs

10300

: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse



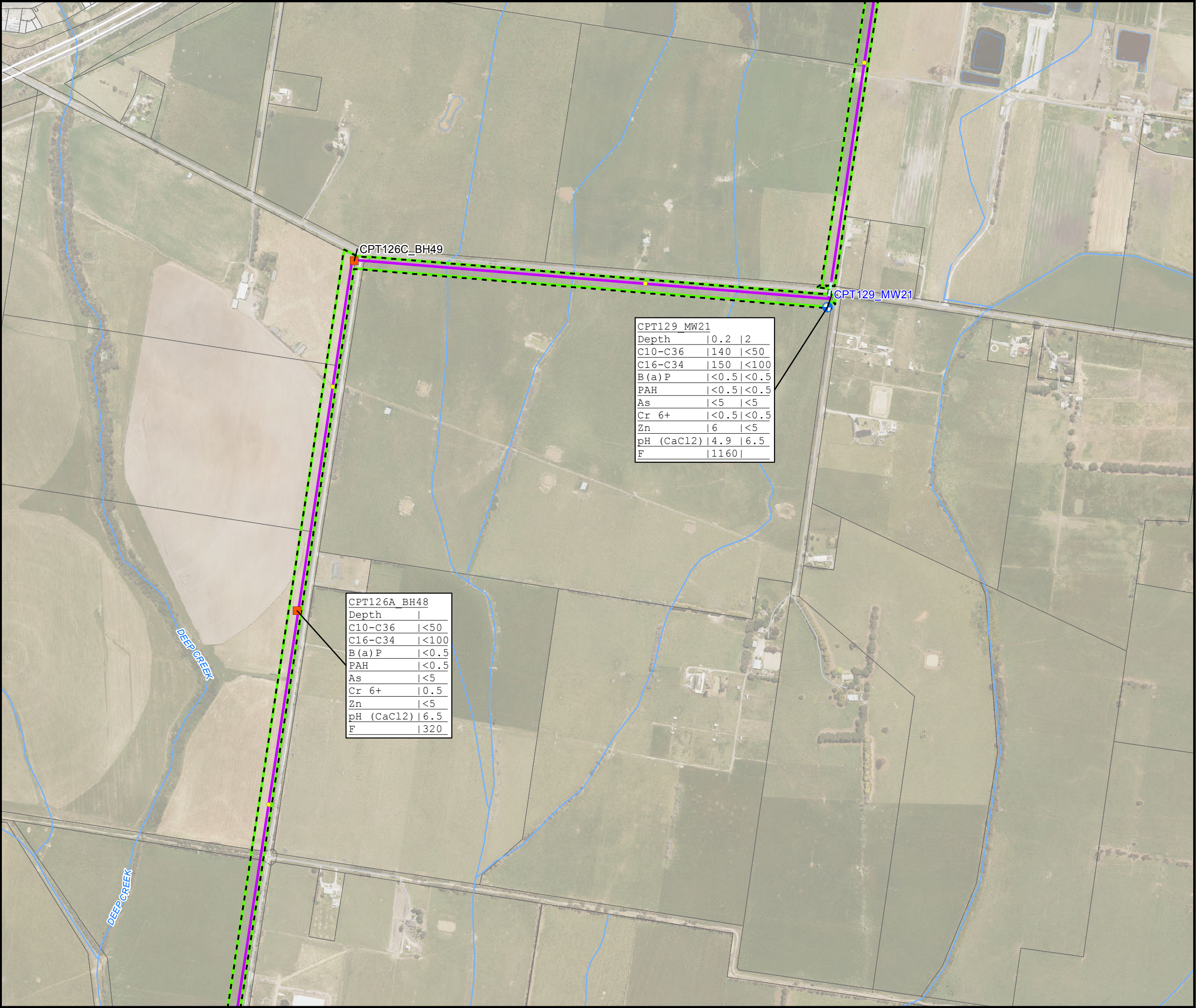
Contaminated soils results – Exceedances
Pipeline - Mapsheet 20 (of 23)



CPT123_BH46	
Depth	
C10-C36	210
C16-C34	180
B(a)P	<0.5
PAH	<0.5
As	<5
Cr 6+	<0.5
Zn	8
pH (CaCl2)	5
F	100

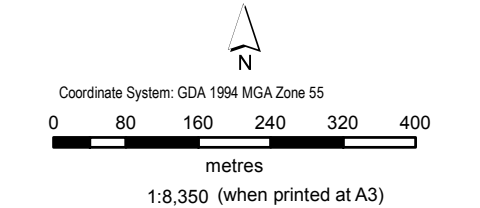
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CPT129_MW21		
Depth	0.2	2
C10-C36	140	<50
C16-C34	150	<100
B(a)P	<0.5	<0.5
PAH	<0.5	<0.5
As	<5	<5
Cr 6+	<0.5	<0.5
Zn	6	<5
pH (CaCl2)	4.9	6.5
F	1160	

CPT126A_BH48		
Depth		
C10-C36	<50	
C16-C34	<100	
B(a)P	<0.5	
PAH	<0.5	
As	<5	
Cr 6+	0.5	
Zn	<5	
pH (CaCl2)	6.5	
F	320	



- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl2) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

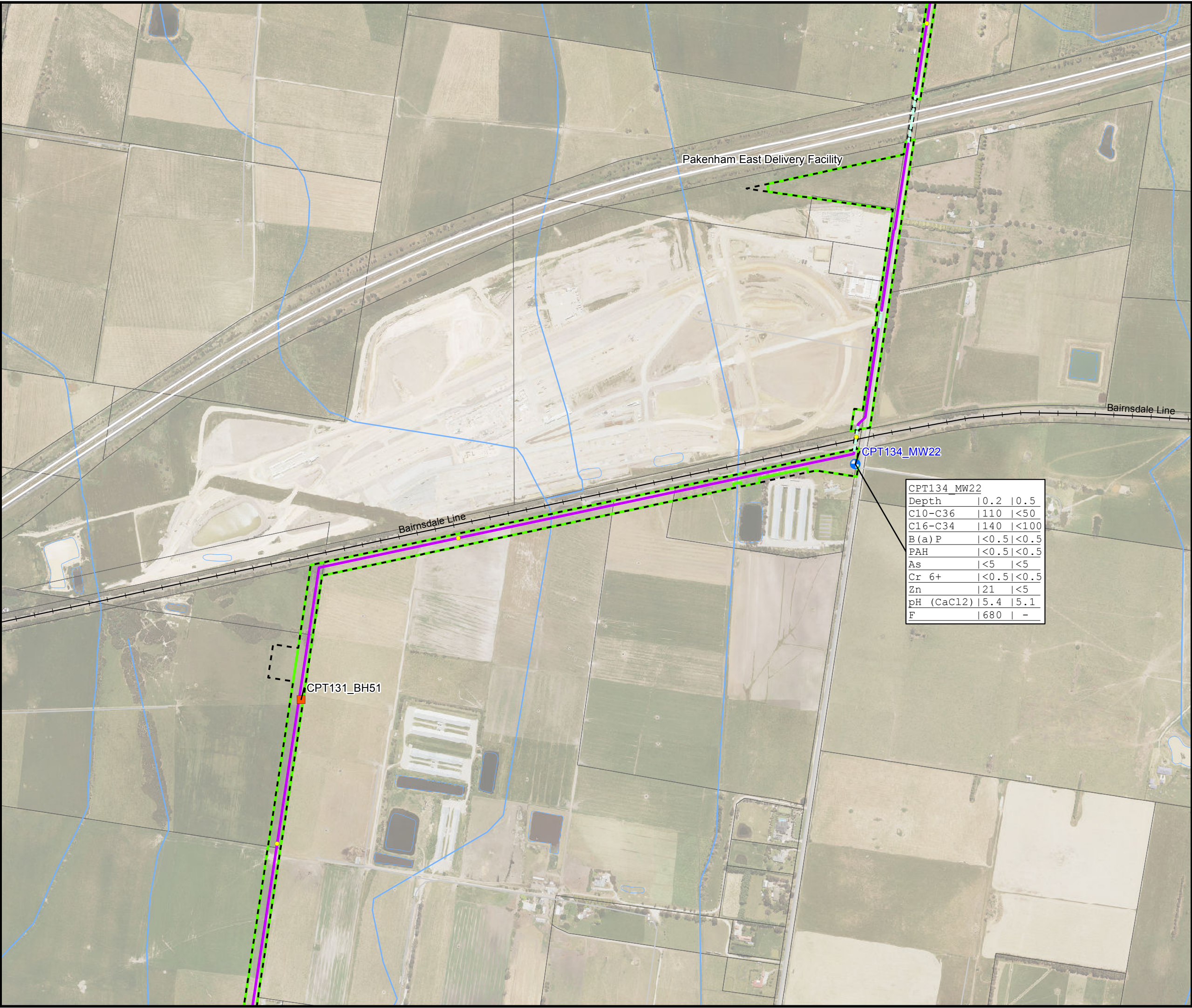
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEP 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 21 (of 23)

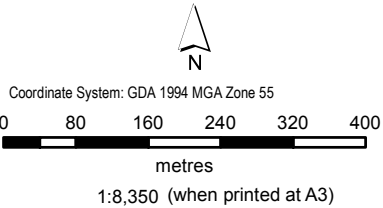
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CPT134_MW22		
Depth	0.2	0.5
C10-C36	110	<50
C16-C34	140	<100
B(a)P	<0.5	<0.5
PAH	<0.5	<0.5
As	<5	<5
Cr 6+	<0.5	<0.5
Zn	21	<5
pH (CaCl2)	5.4	5.1
F	680	-

PROJECT ID 60592634
CREATED BY sam.schroder
LAST MODIFIED sam.schroder 26 MAY 2020
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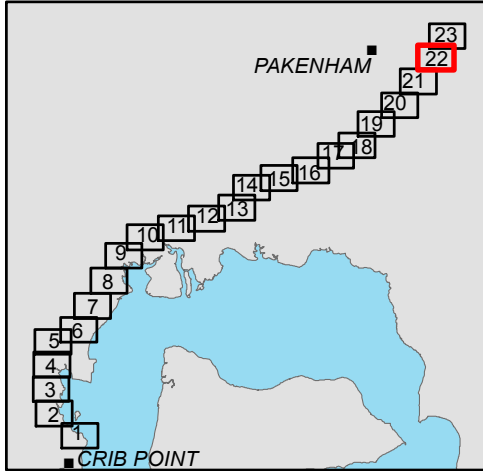
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl₂) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse

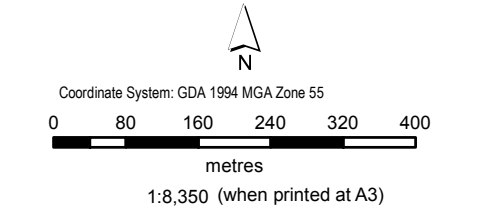
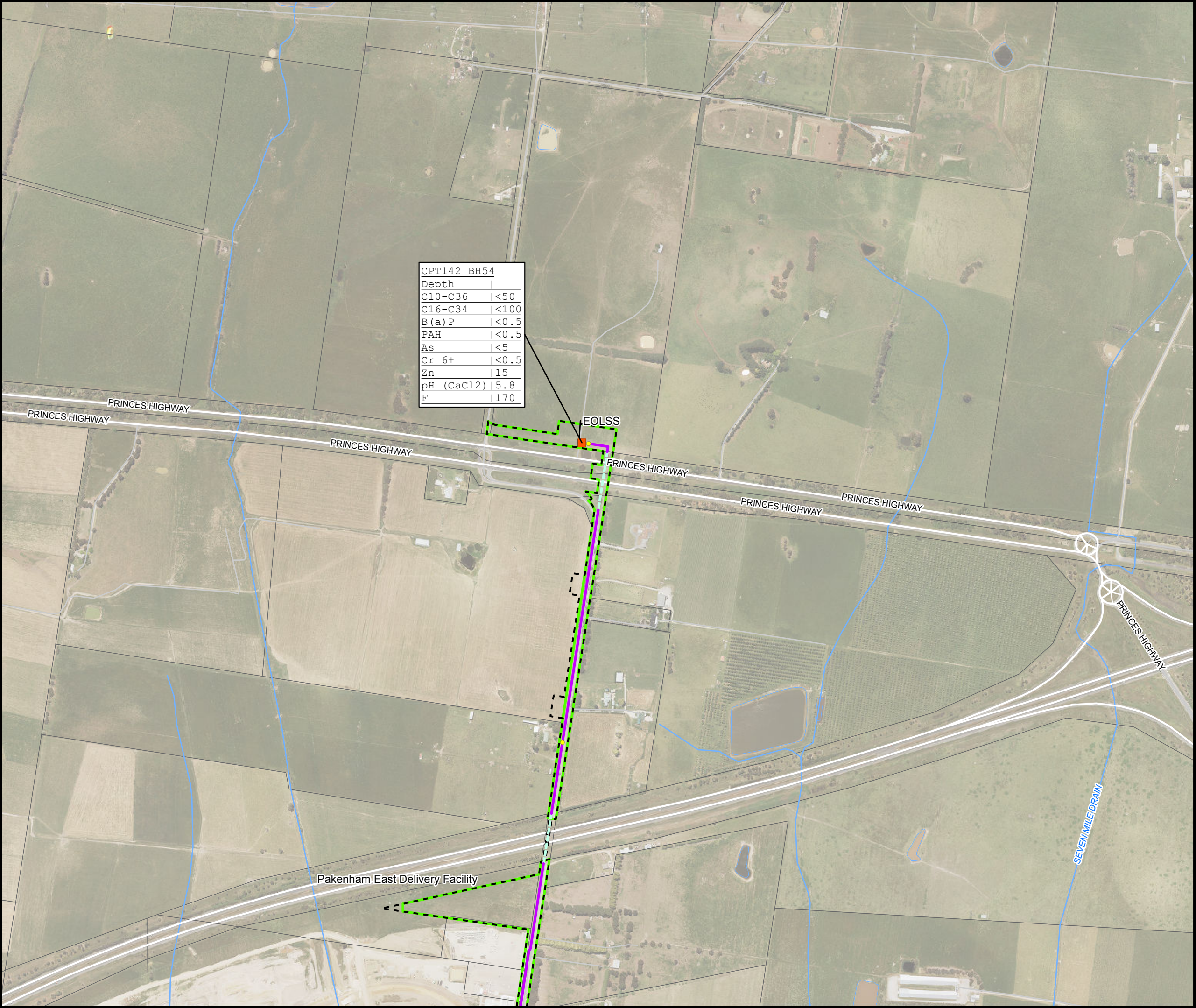


Contaminated soils results – Exceedances Pipeline - Mapsheet 22 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

Figure
A5-22

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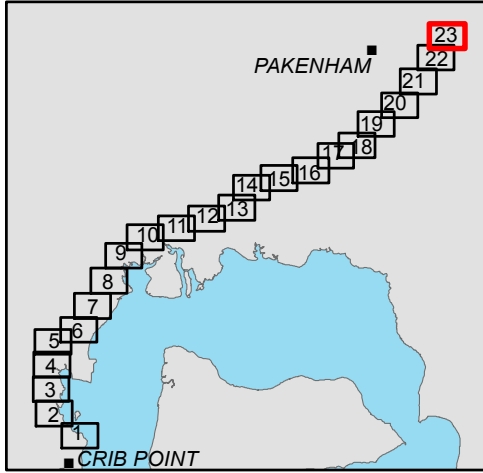
- LEGEND**
- Grid soil bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

C10-C36 - Total Petroleum Hydrocarbons
B(a)P - Benzo[a]pyrene
PAH - Polycyclic Aromatic Hydrocarbons
As - Arsenic
Cr+6 - Chromium (VI)
Zn - Zinc
pH (CaCl₂) - pH (Calcium Chloride)
F - Fluoride
< 0.5 - < Limit of Reporting

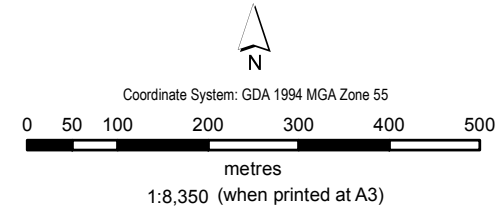
Guideline Exceedances:

340: Category B Upper Limits
0.04: Category C Upper Limits
507: Fill Material Upper Limits
340 NEPM 2013 Table 1A(1) HILs Res A Soil
0.04: NEPM 2013 Table 1B(1-5) Site specific EILs
10300: NEP 2013 Table 1B(6) ESLs for Urban Res, Coarse



Contaminated soils results – Exceedances Pipeline - Mapsheet 23 (of 23)

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- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Targeted soil bore analysed for PFAS
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Crib Point Receiving Facility
 - Waterbody

Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)

CRS - Chromium Reducible Sulfur (%S)

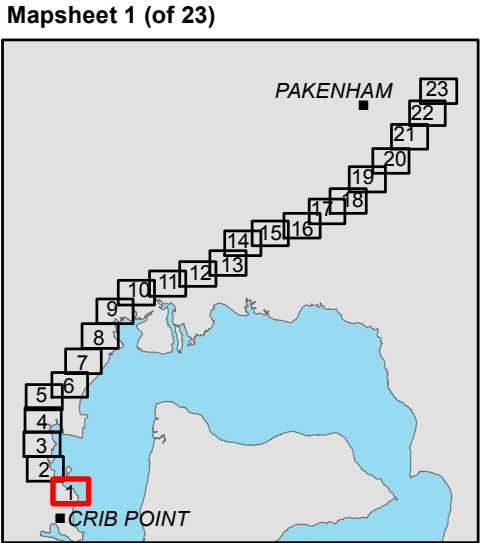
NA - Net Acidity (sulfur unit) (%S)

LR - Liming Rate (Kilogram CaCO3/ tonne)

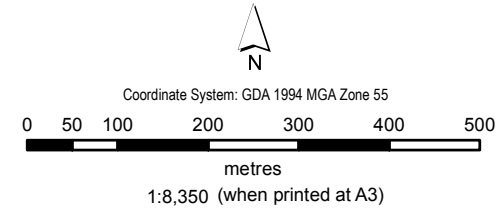
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.



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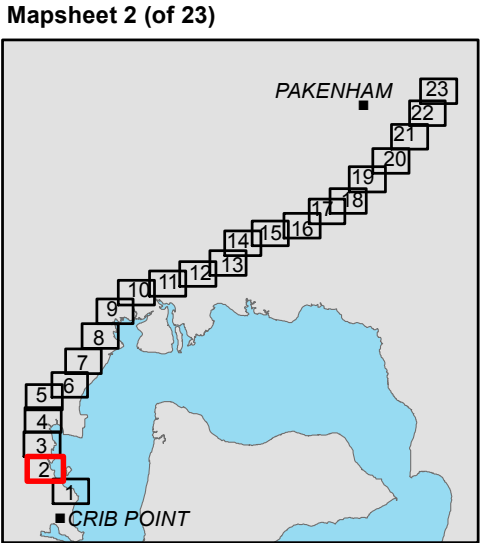
- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Rail
 - Watercourse
 - Waterbody

Analytical Results:

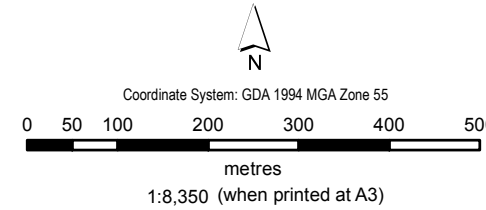
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.



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LEGEND

- Groundwater monitoring bore
- Kilometre points
- Grid soil bore
- Targeted soil bore
- Open - Cut
- Trenchless
- Total Study Area
- Construction Footprint
- Rail
- Watercourse
- Waterbody

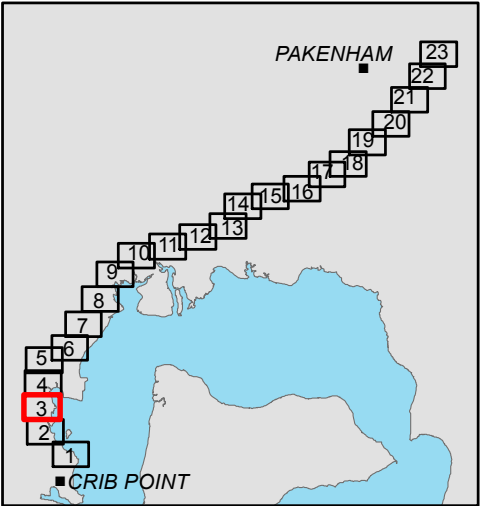
Analytical Results:

TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

Mapsheet 3 (of 23)

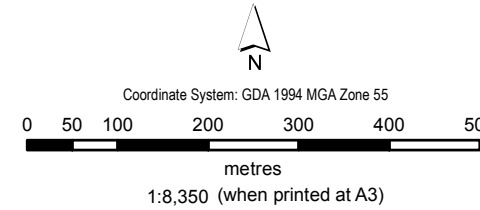
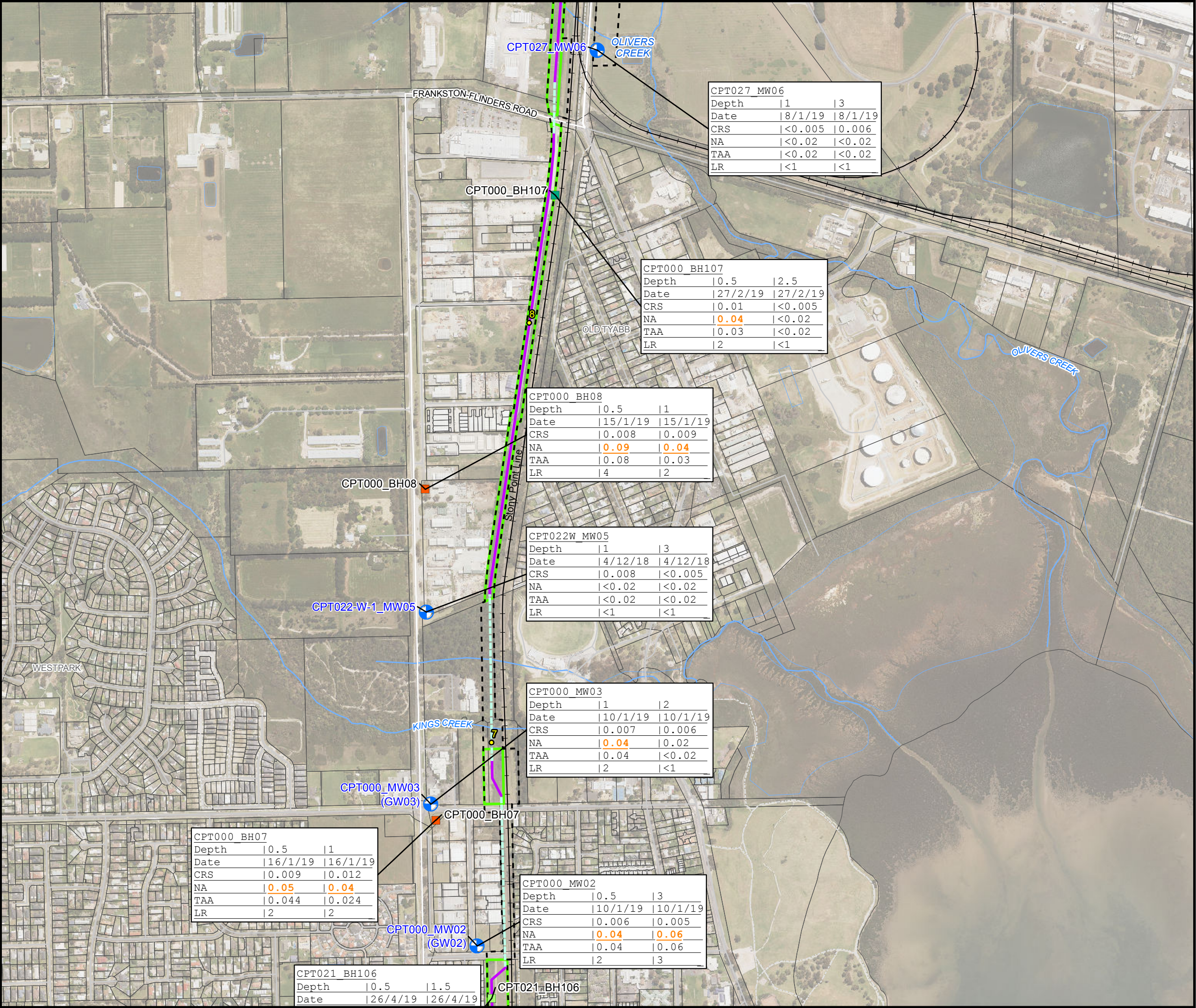


Acid Sulfate Soil Results

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A6-3

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LEGEND

- Groundwater monitoring bore
- Kilometre points
- Grid soil bore
- Targeted soil bore
- Targeted soil bore analysed for PFAS
- Open - Cut
- Trenchless
- Total Study Area
- Construction Footprint
- Rail
- Watercourse
- Waterbody

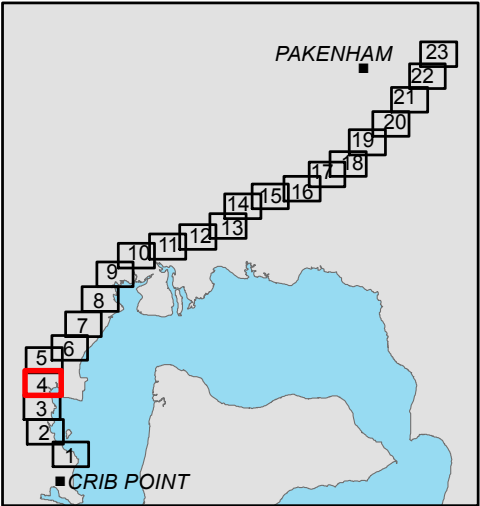
Analytical Results:

TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO₃/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

Mapsheet 4 (of 23)

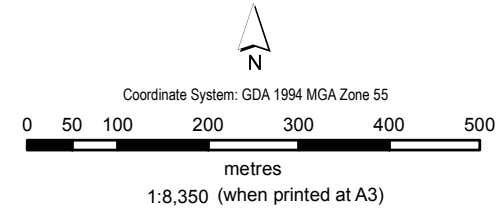
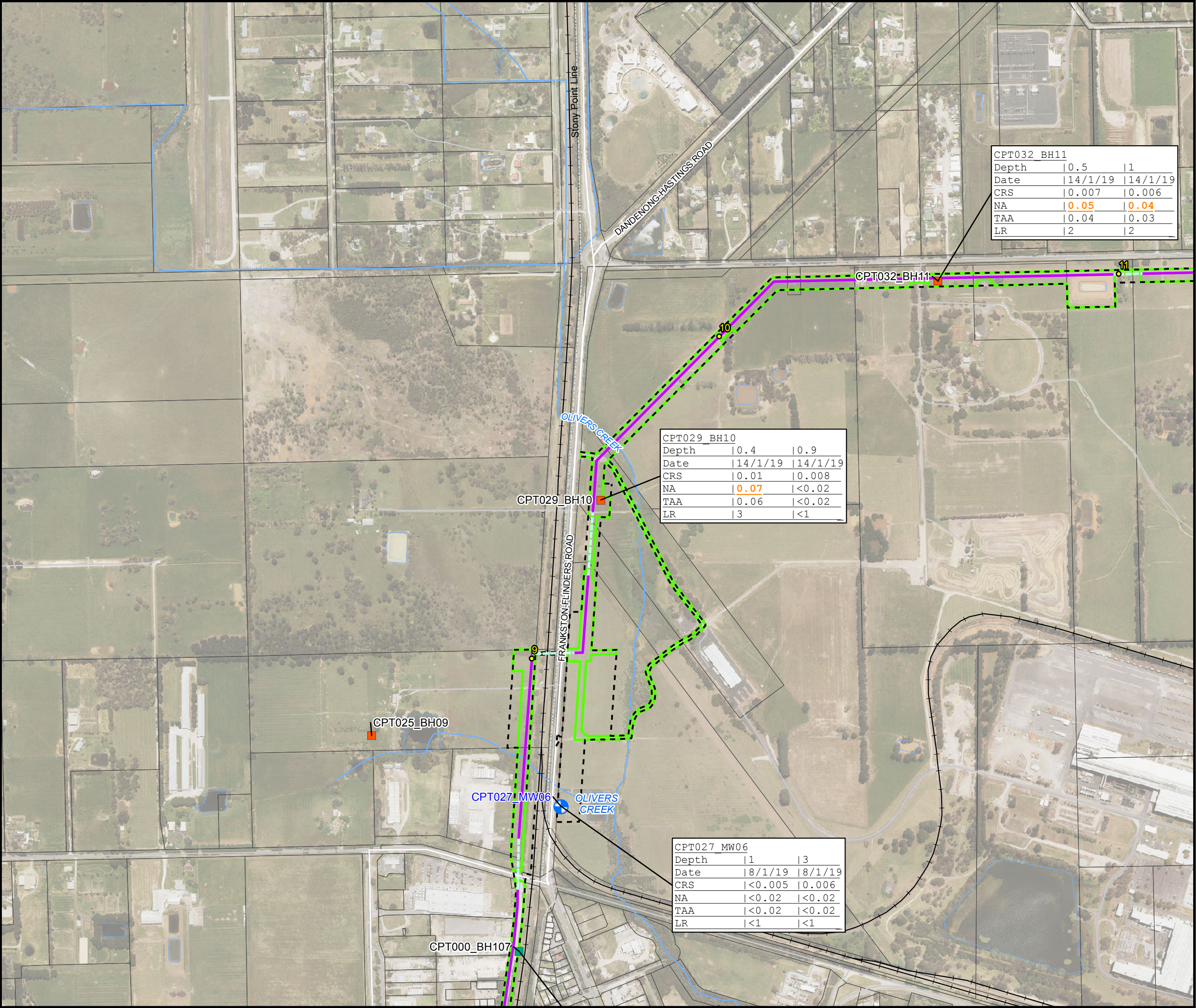


Acid Sulfate Soil Results

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A6-4

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LEGEND

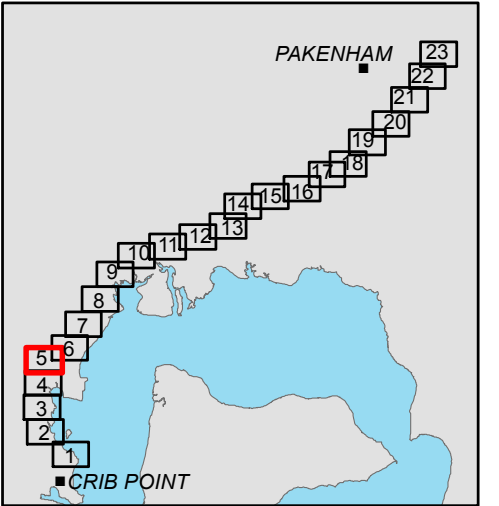
- Groundwater monitoring bore
- Kilometre points
- Grid soil bore
- Targeted soil bore analysed for PFAS
- Open - Cut
- Trenchless
- Total Study Area
- Construction Footprint
- Rail
- Watercourse
- Waterbody

Analytical Results:

TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

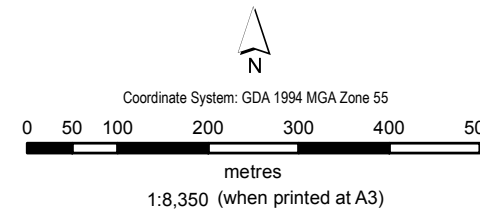
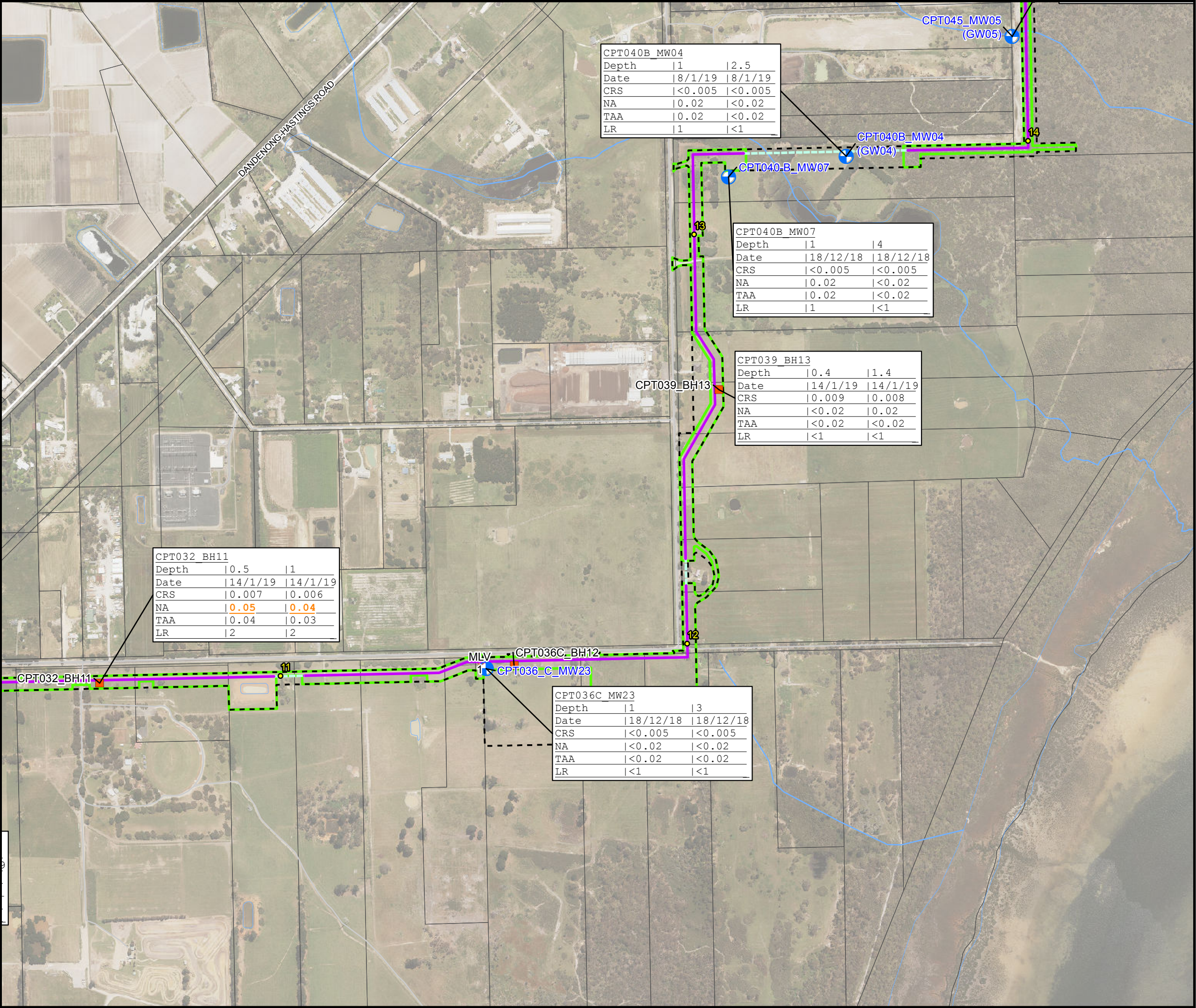
0.04: Exceeding guidelines
Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

Mapsheet 5 (of 23)



Acid Sulfate Soil Results

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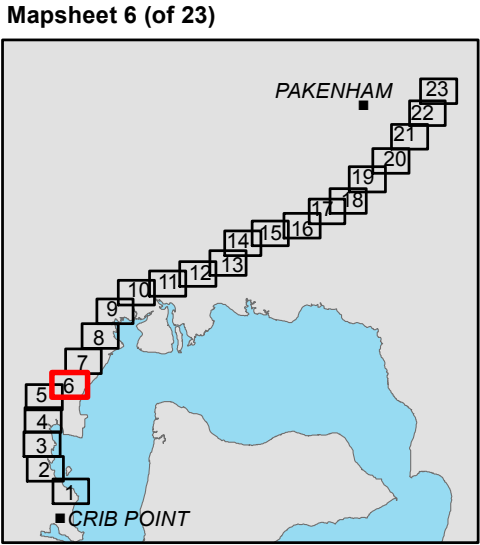


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - MLV 1
 - Watercourse
 - Waterbody

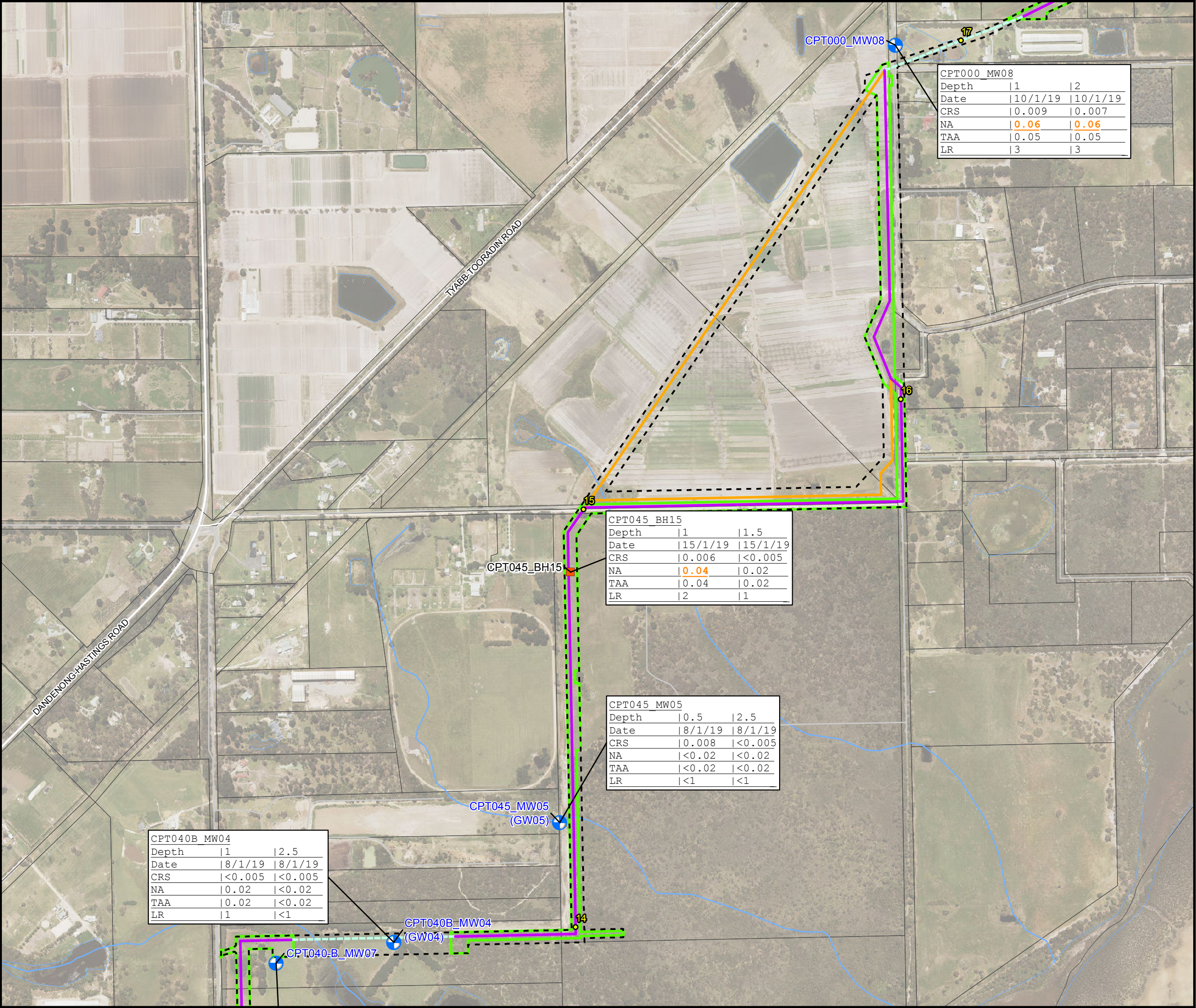
Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.



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CPT040B MW04		
Depth	1	2.5
Date	8/1/19	8/1/19
CRS	<0.005	<0.005
NA	0.02	<0.02
TAA	0.02	<0.02
LR	1	<1

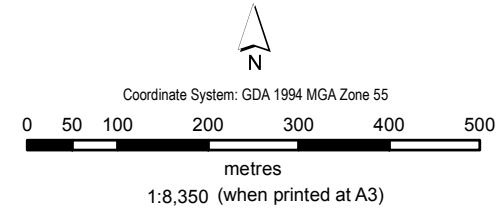
CPT045 BH15		
Depth	1	1.5
Date	15/1/19	15/1/19
CRS	0.006	<0.005
NA	0.04	0.02
TAA	0.04	0.02
LR	2	1

CPT045 MW05		
Depth	0.5	2.5
Date	8/1/19	8/1/19
CRS	0.008	<0.005
NA	<0.02	<0.02
TAA	<0.02	<0.02
LR	<1	<1

CPT000 MW08		
Depth	1	2
Date	10/1/19	10/1/19
CRS	0.009	0.007
NA	0.06	0.06
TAA	0.05	0.05
LR	3	3

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LAST MODIFIED sam.schroder 26 MAY 2020

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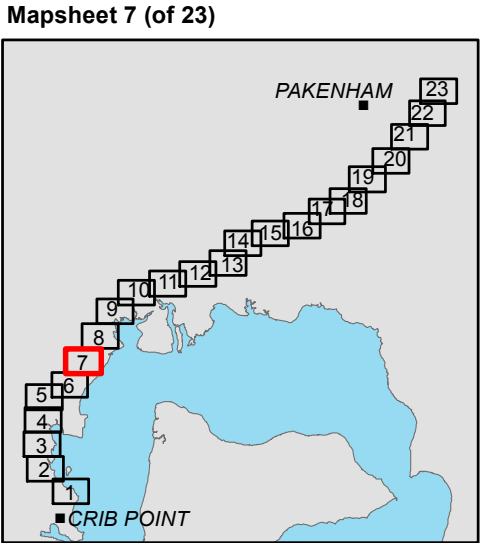


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

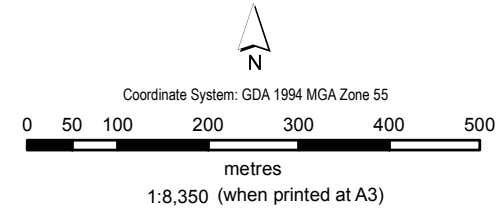
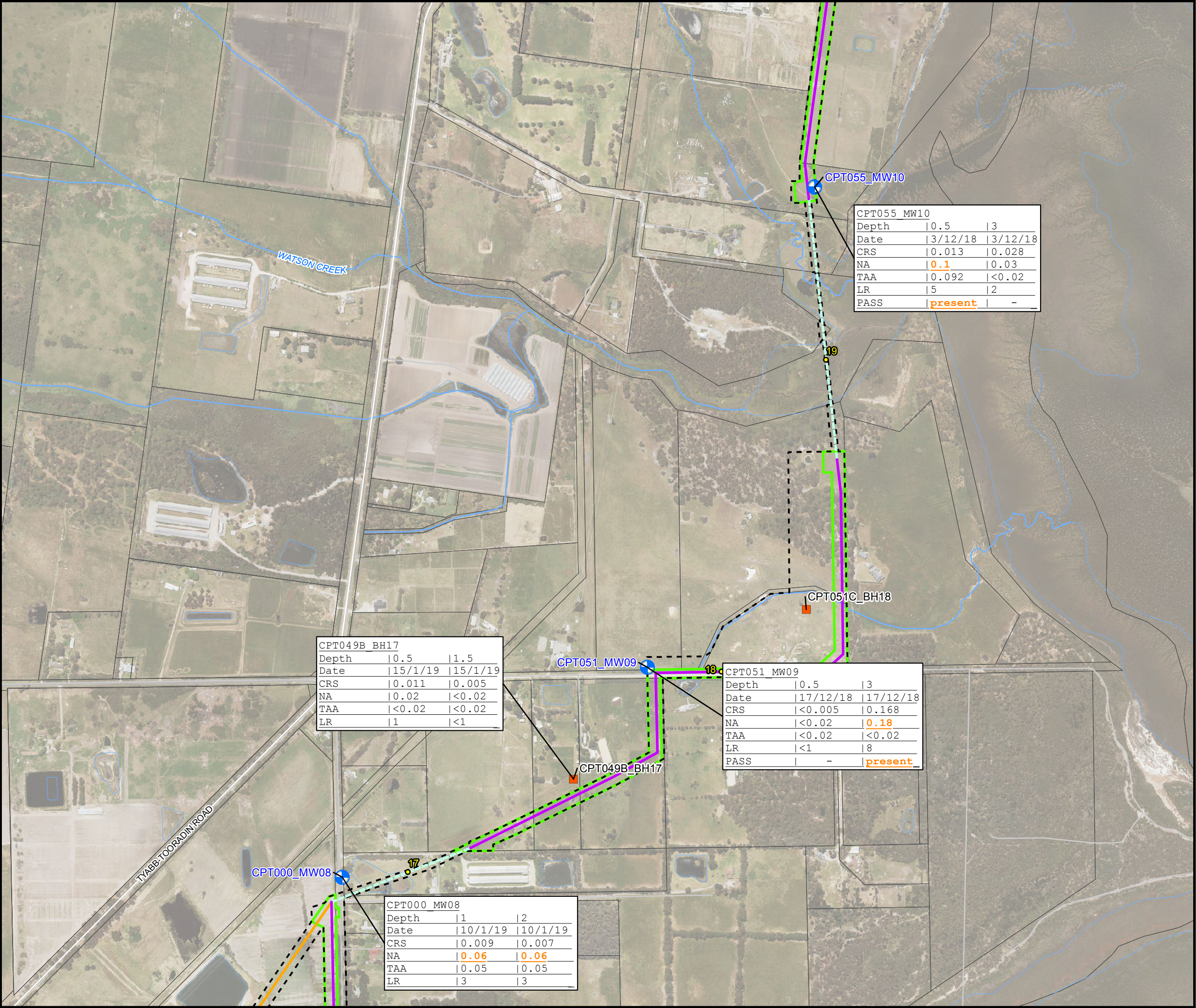


Acid Sulfate Soil Results

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A6-7

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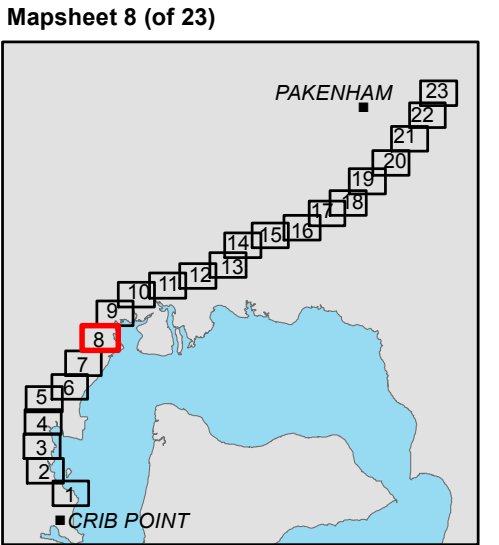


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

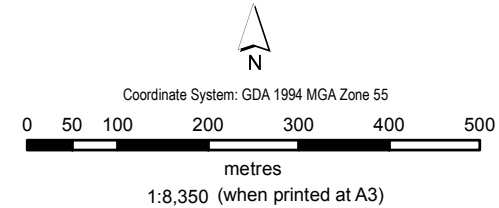


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CPT000 MW11		
Depth	0.5	2
Date	9/1/19	9/1/19
CRS	0.012	<0.005
NA	0.09	<0.02
TAA	0.07	<0.02
LR	4	<1

CPT056 BH19		
Depth	0.5	2
Date	15/1/19	15/1/19
CRS	0.014	0.023
NA	0.03	0.04
TAA	<0.02	<0.02
LR	1	2

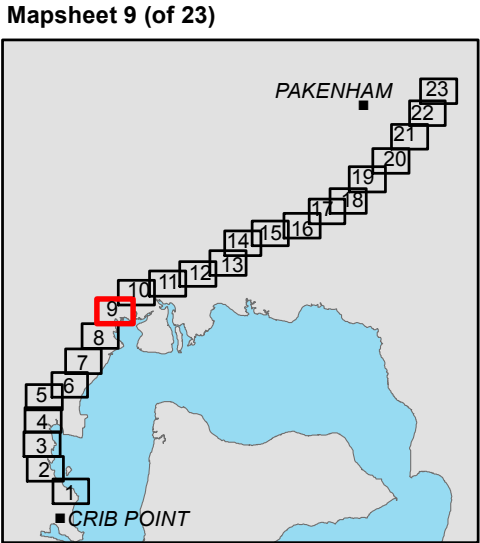


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

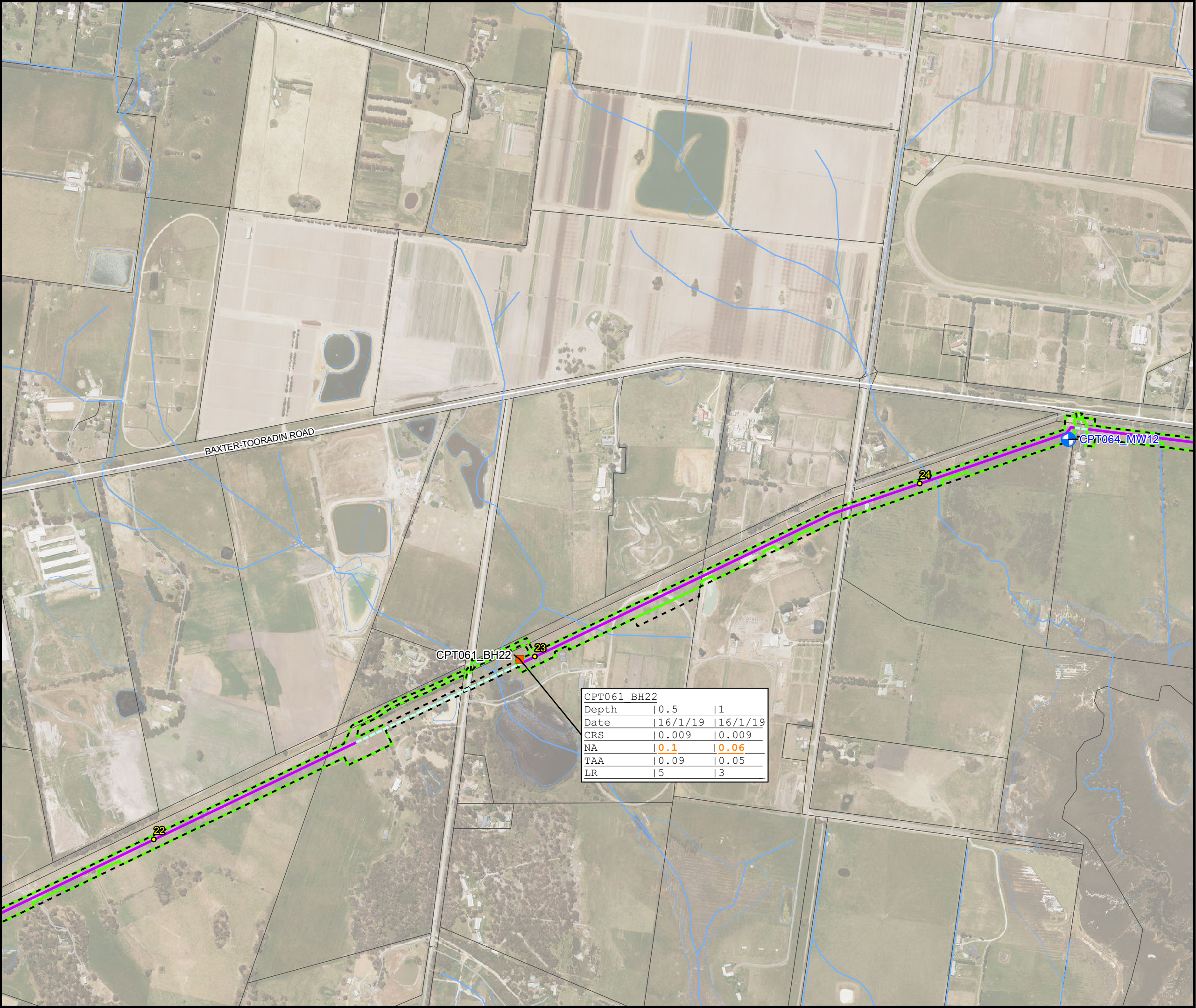
Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

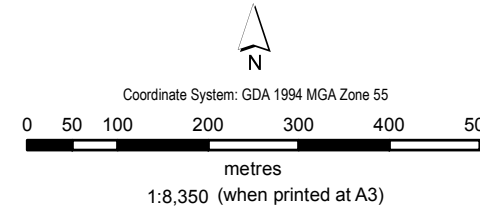


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CPT061_BH22		
Depth	0.5	1
Date	16/1/19	16/1/19
CRS	0.009	0.009
NA	0.1	0.06
TAA	0.09	0.05
LR	5	3

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LAST MODIFIED sam.schroder 26 MAY 2020
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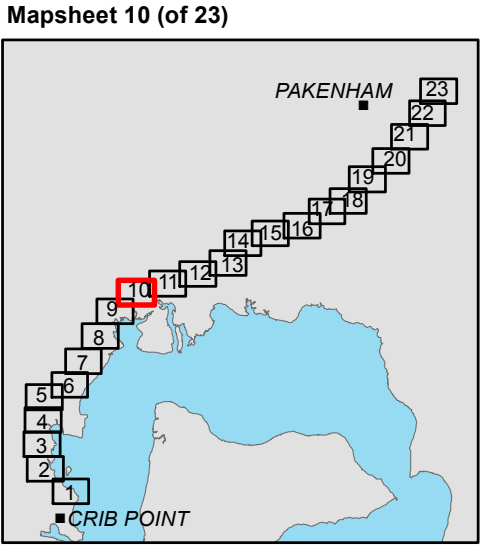


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

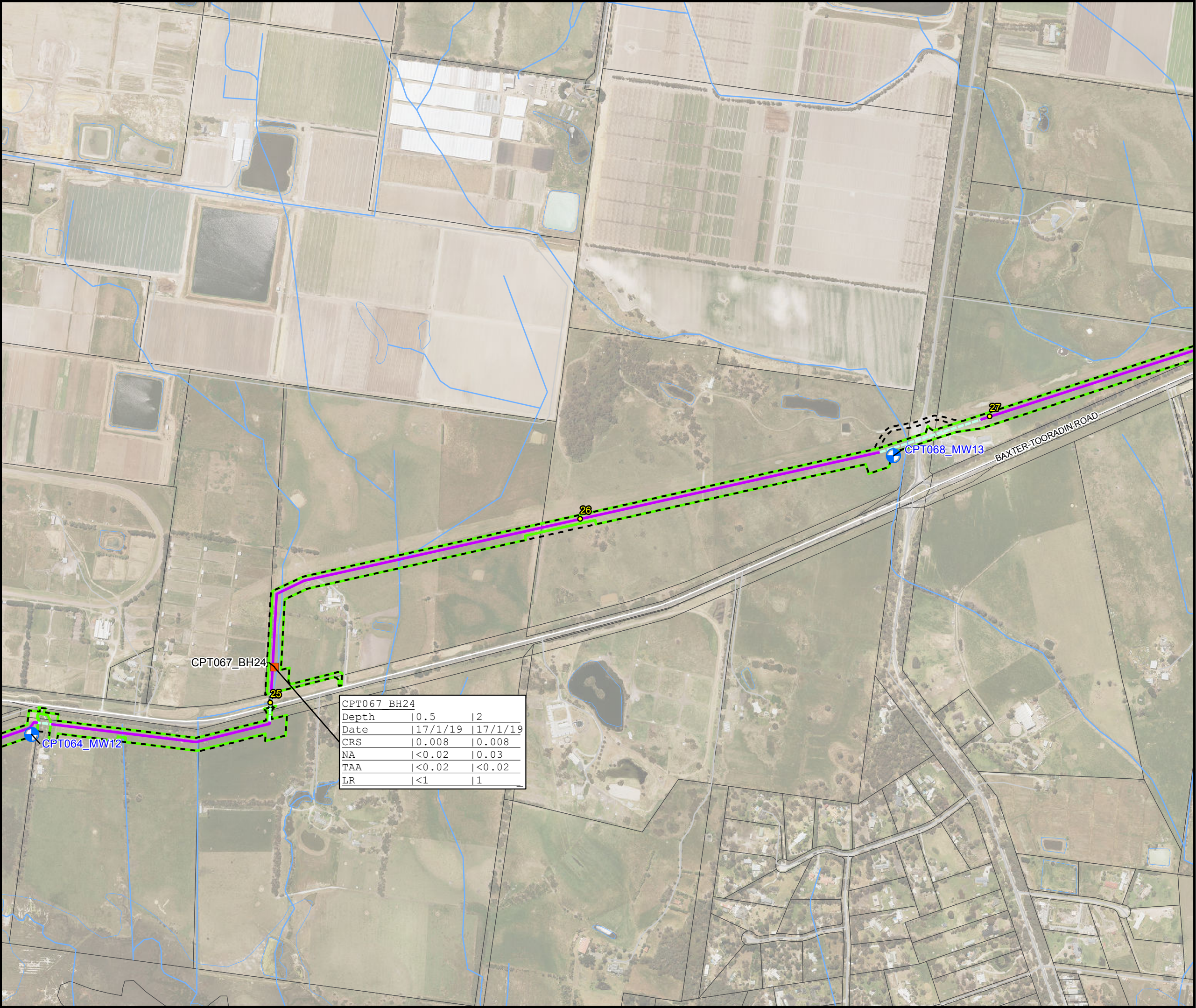


Acid Sulfate Soil Results

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

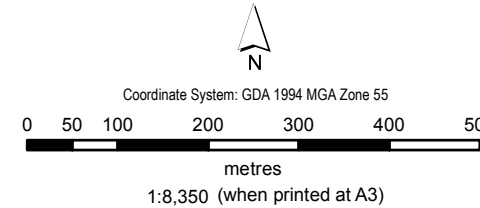
Figure
A6-10

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CPT067_BH24		
Depth	0.5	2
Date	17/1/19	17/1/19
CRS	0.008	0.008
NA	<0.02	0.03
TAA	<0.02	<0.02
LR	<1	1

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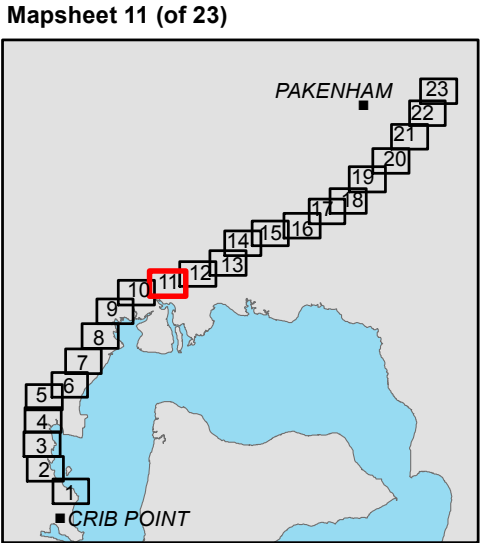


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.



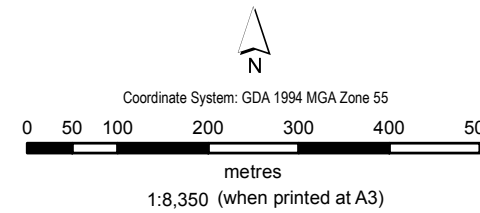
Acid Sulfate Soil Results

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CPT073_BH27		
Depth	0.5	1.5
Date	17/1/19	17/1/19
CRS	0.006	<0.005
NA	0.02	<0.02
TAA	<0.02	<0.02
LR	<1	<1

CPT037B_MW14		
Depth	0.5	2
Date	3/12/18	3/12/18
CRS	0.01	<0.005
NA	0.03	<0.02
TAA	<0.02	<0.02
LR	1	<1



- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

Analytical Results:

TAA - Titratable Actual Acidity (% pyrite S)

CRS - Chromium Reducible Sulfur (%S)

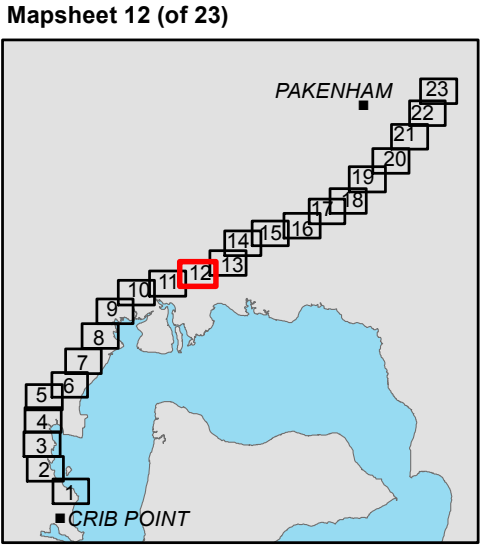
NA - Net Acidity (sulfur unit) (%S)

LR - Liming Rate (Kilogram CaCO3/ tonne)

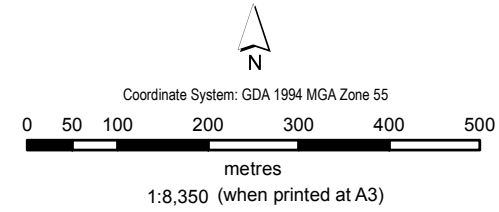
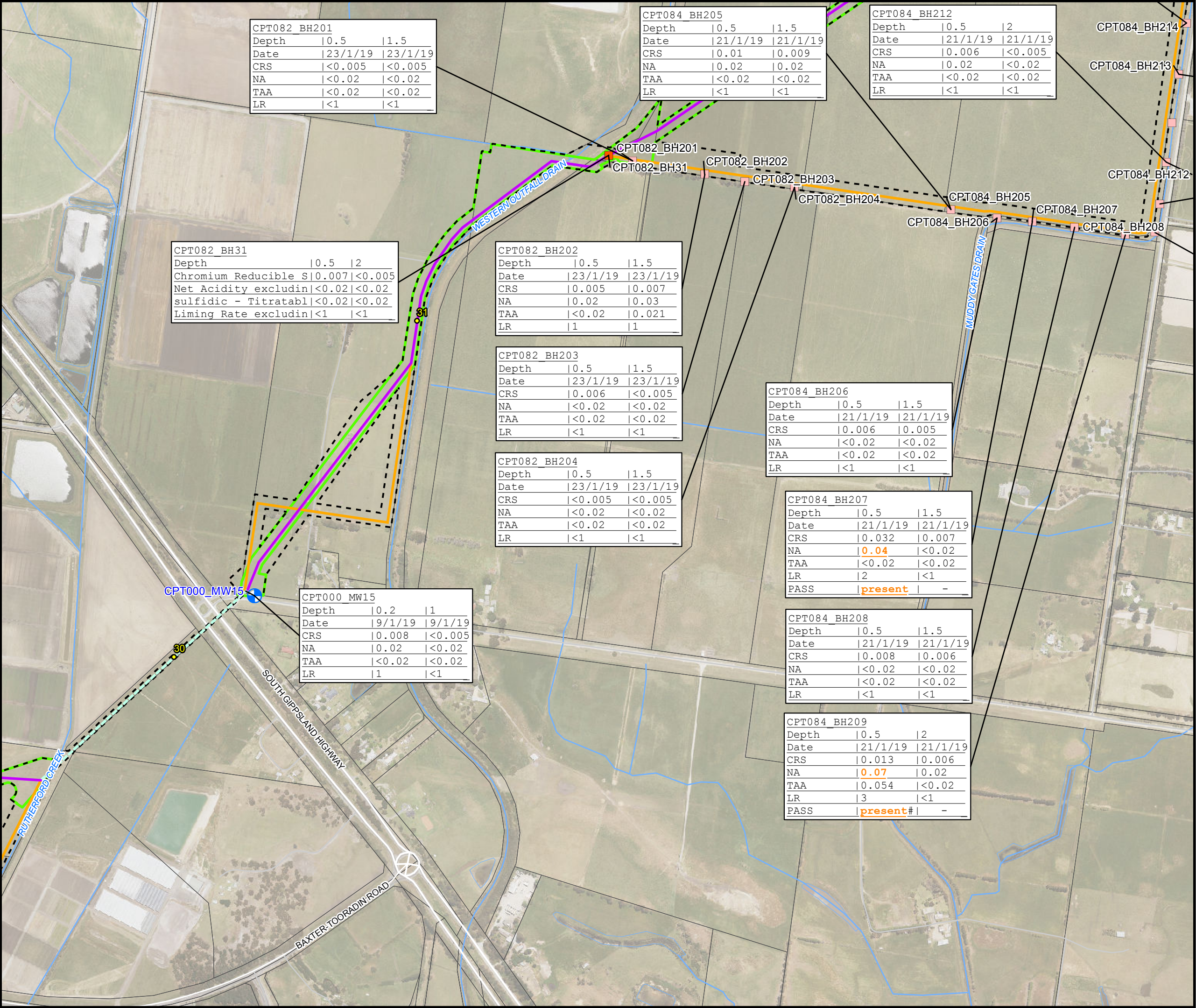
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.



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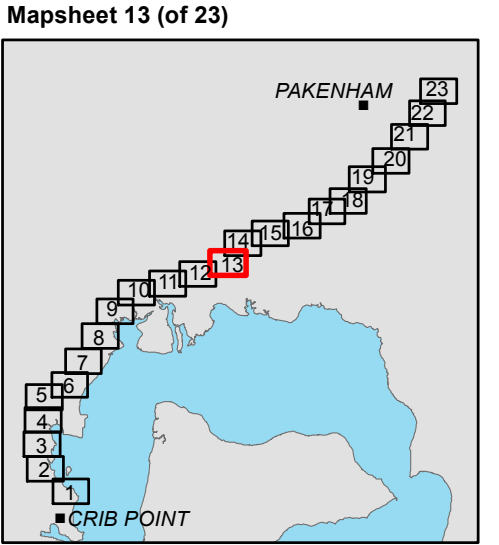


- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Targeted acid sulfate soil bore
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Watercourse
 - Waterbody

Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO₃/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.



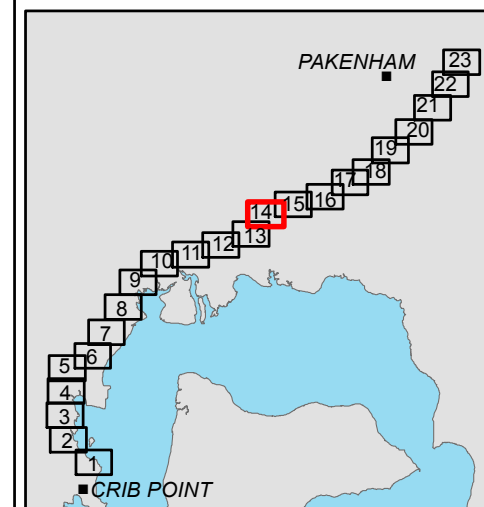


- ### Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO₃/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

```
# Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.
```

Mapsheet 14 (of 23)

Acid Sulfate Soil Results

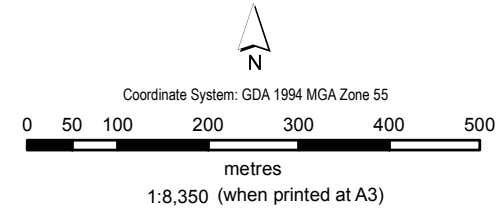
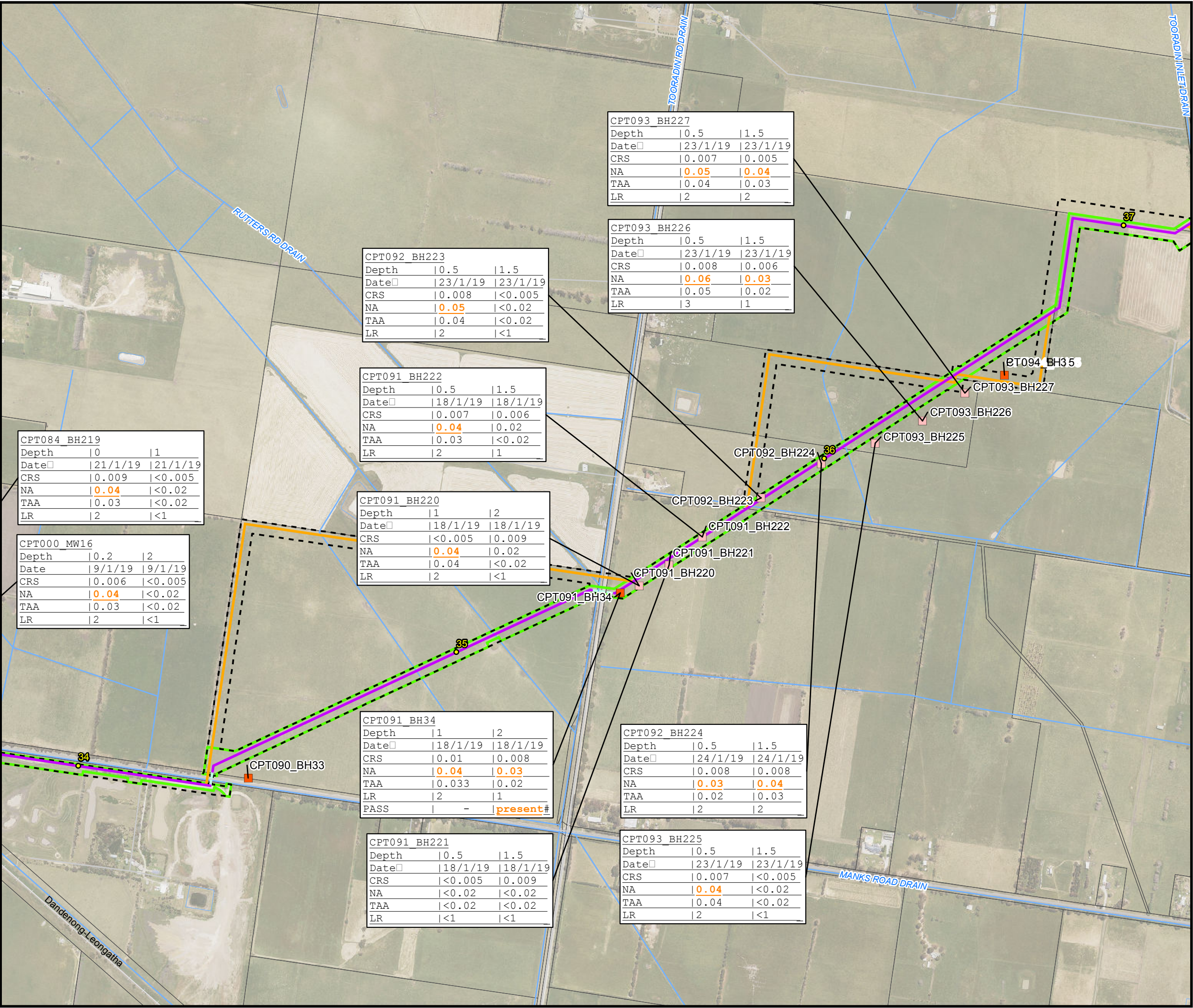
APA

Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure

A6-14

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LEGEND

- Kilometre points
- Grid soil bore
- Targeted acid sulfate soil bore
- Open - Cut
- Trenchless
- Pipeline Alignment Options
- Total Study Area
- Construction Footprint
- Rail disused/ dismantled/ rail trail
- Watercourse
- Waterbody

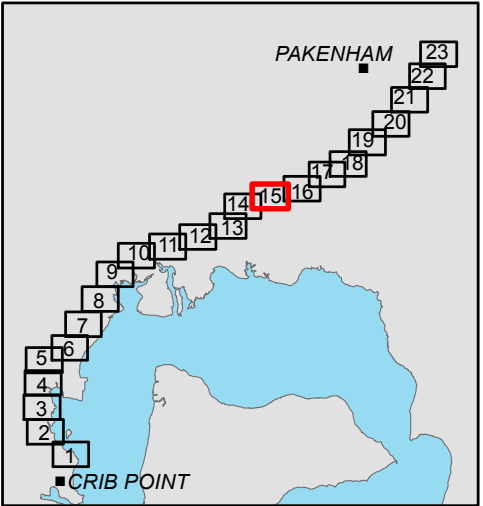
Analytical Results:

TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

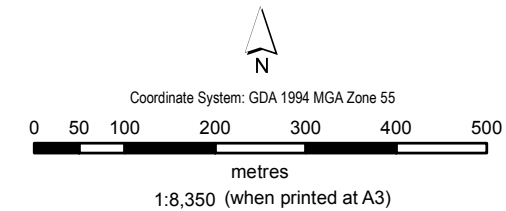
Mapsheet 15 (of 23)



Acid Sulfate Soil Results

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A6-15



- LEGEND
- Groundwater monitoring bore

Kilometre points

Grid soil bore

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

Watercourse

Waterbody
- Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

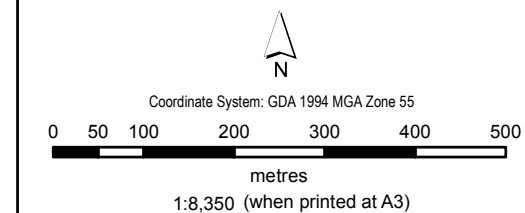
0.04: Exceeding guidelines

Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.
- Mapsheet 16 (of 23)
-
- Acid Sulfate Soil Results
- APA

Contamination and acid sulfate soils

Gas Import Jetty and Pipeline Project
Environment Effects Statement
- Figure

A6-16
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-
- | | | |
|-------------|-------|--|
| CPT099 BH37 | | |
| Depth | | |
| Date | | |
| CRS | 0.008 | |
| NA | 0.08 | |
| TAA | 0.07 | |
| LR | 4 | |
- | | | |
|-------------|---------|---------|
| CPT099 MW17 | | |
| Depth | 0.5 | 2 |
| Date | 11/1/19 | 11/1/19 |
| CRS | 0.01 | 0.008 |
| NA | 0.09 | 0.04 |
| TAA | 0.08 | 0.03 |
| LR | 4 | 2 |
- Map Document: (\\aume11fp001\Projects\605X\60592634\900_CAD_GIS\920_GIS\02_Maps\Contam_Land\FA6_Contam_Sulfate_Results_20191007.mxd)
- A3 size



- LEGEND
- Groundwater monitoring bore

Kilometre points

Grid soil bore

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

MLV 2

MLV 2 - Land area

Watercourse

Waterbody
- Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.
- Mapsheet 17 (of 23)
- Acid Sulfate Soil Results

APA

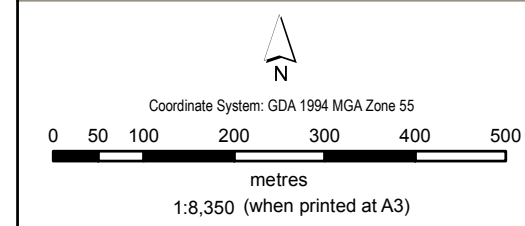
Contamination and acid sulfate soils

Gas Import Jetty and Pipeline Project

Environment Effects Statement

Figure

A6-17
- AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.
- Map Document: (\\naumel1fp001\Projects\605X\60592634\900_CAD_GIS\920_GIS\02_Maps\Contam_Land\FA6_Contam_Sulfate_Results_20191007.mxd)
- A3 size



- LEGEND
- Groundwater monitoring bore

Kilometre points

Grid soil bore

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

Watercourse

Waterbody
- Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

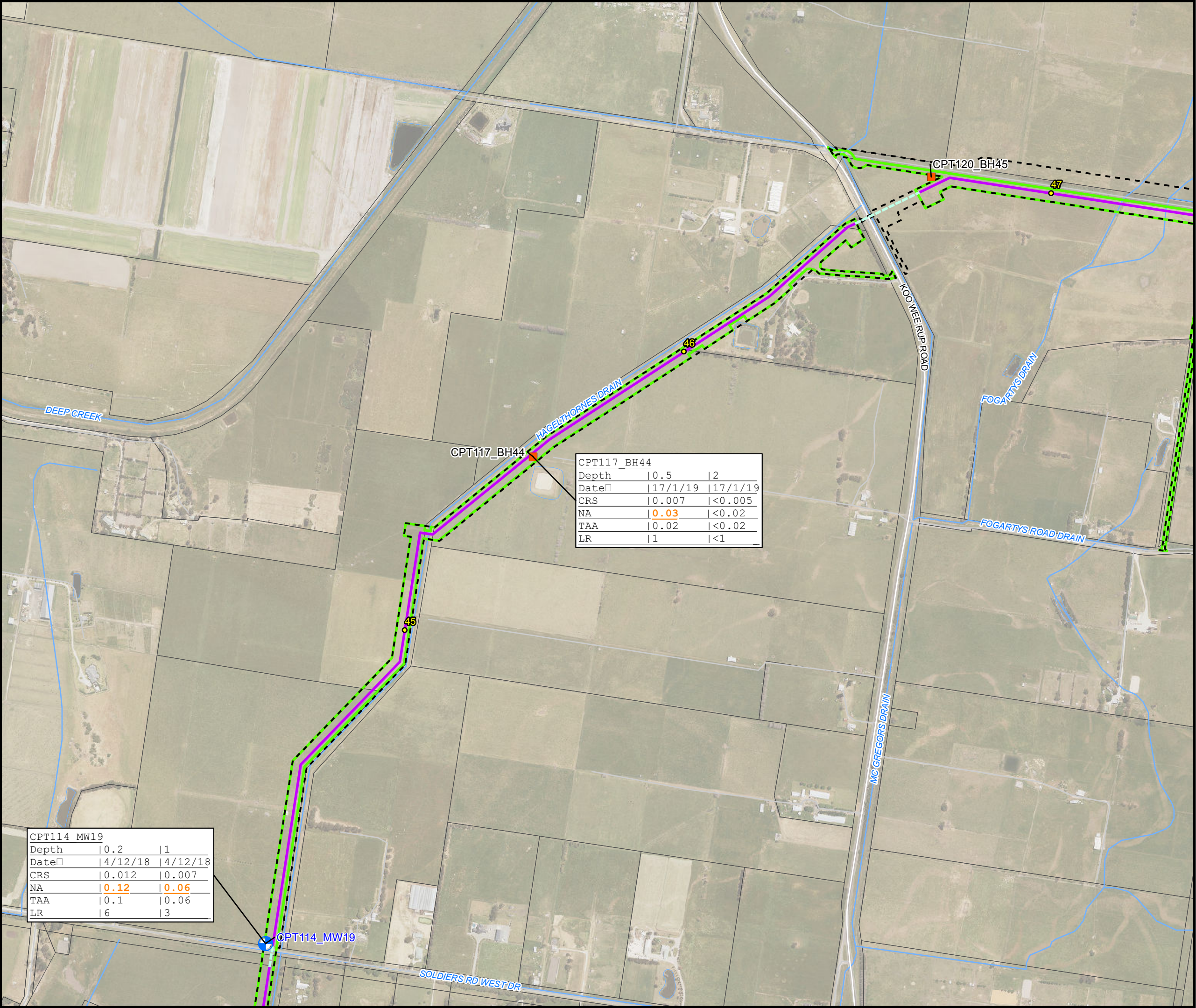
Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.
- Mapsheet 18 (of 23)
- Acid Sulfate Soil Results

APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A6-18
-
- Map Document: (\\naumel1fp001\Projects\605X\60592634\900_CAD_GIS\920_GIS\02_Maps\Contam_Land\FA6_Contam_Sulfate_Results_20191007.mxd)

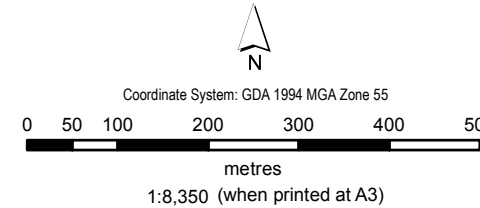
A3 size

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CPT114 MW19		
Depth	0.2	1
Date	4/12/18	4/12/18
CRS	0.012	0.007
NA	0.12	0.06
TAA	0.1	0.06
LR	6	3

CPT117 BH44		
Depth	0.5	2
Date	17/1/19	17/1/19
CRS	0.007	<0.005
NA	0.03	<0.02
TAA	0.02	<0.02
LR	1	<1



- LEGEND
- Groundwater monitoring bore
- Kilometre points
- Grid soil bore
- Open - Cut
- Trenchless
- Total Study Area
- Construction Footprint
- Watercourse
- Waterbody

Analytical Results:

TAA - Titratable Actual Acidity (% pyrite S)

CRS - Chromium Reducible Sulfur (%S)

NA - Net Acidity (sulfur unit) (%S)

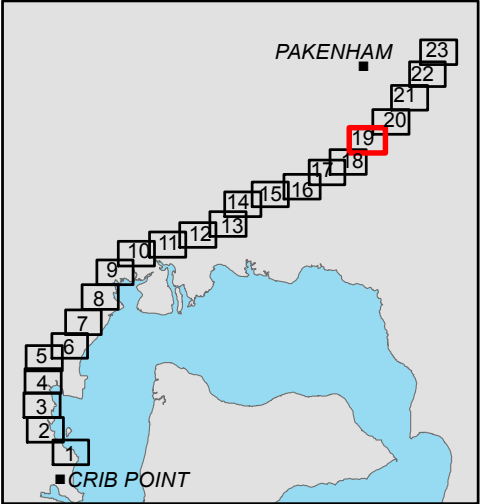
LR - Liming Rate (Kilogram CaCO3/ tonne)

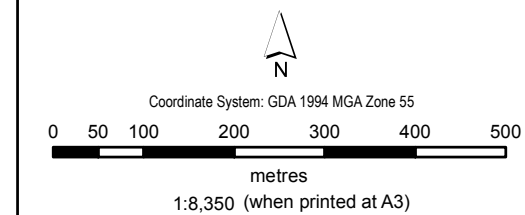
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

Mapsheet 19 (of 23)





- LEGEND
- Kilometre points

Grid soil bore

Open - Cut

Trenchless

Total Study Area

Construction Footprint

Watercourse

Waterbody
- Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

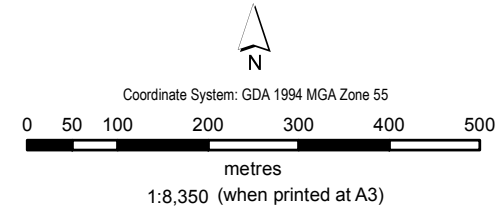
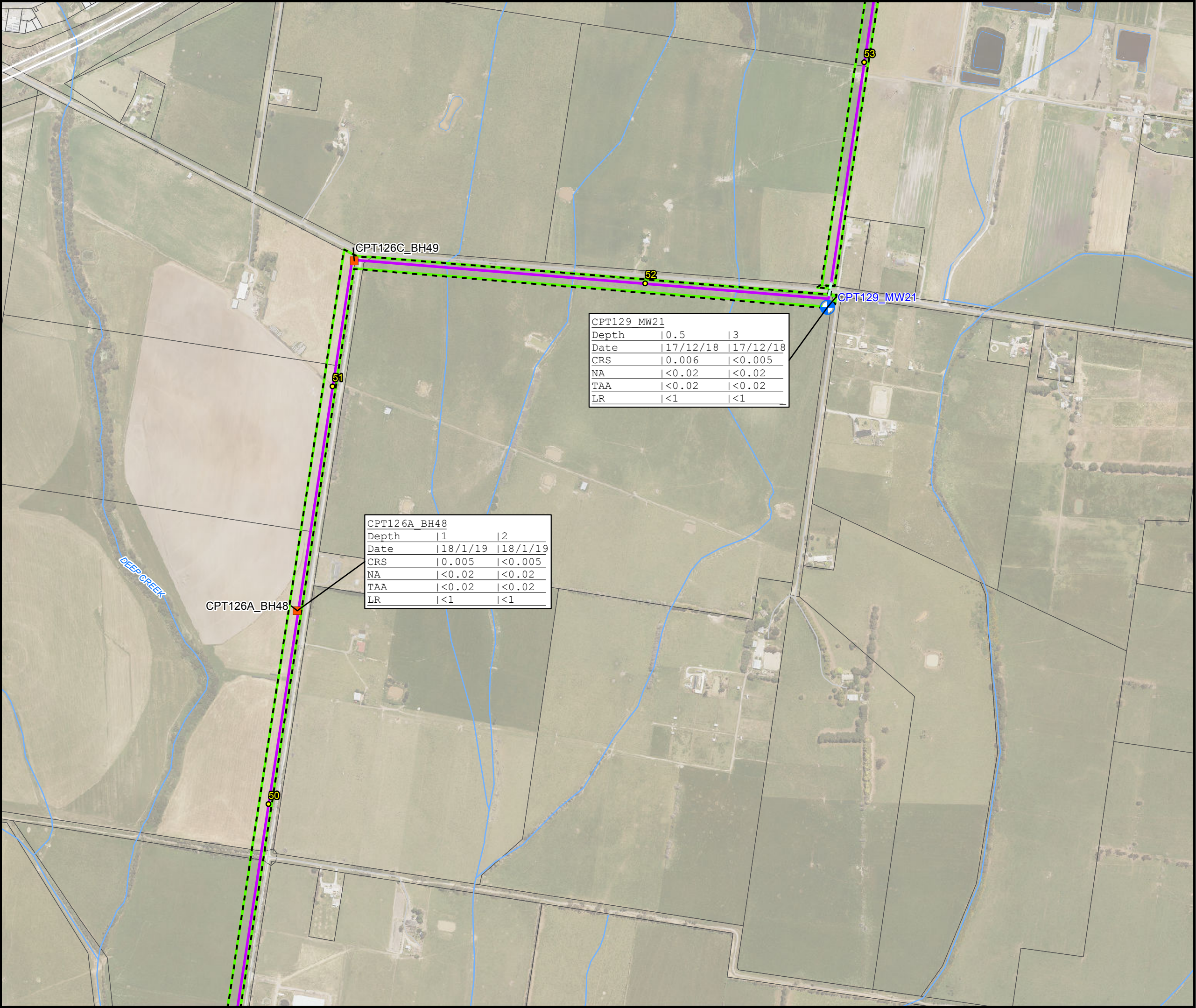
0.04: Exceeding guidelines

Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.
- Mapsheet 20 (of 23)
- APA
Contamination and acid sulfate soils
Gas Import Jetty and Pipeline Project
Environment Effects Statement

Figure
A6-20
- | | | |
|-------------|---------|---------|
| CPT123_BH46 | | |
| Depth | 0.5 | 1.5 |
| Date | 17/1/19 | 17/1/19 |
| CRS | <0.005 | 0.005 |
| NA | 0.03 | 0.05 |
| TAA | 0.03 | 0.05 |
| LR | 1 | 2 |
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- Map Document: (\\aume11fp001\Projects\605X\60592634\900_CAD_GIS\920_GIS\02_Maps\Contam_Land\FA6_Contam_Sulfate_Results_20191007.mxd)

A3 size

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- LEGEND
- Groundwater monitoring bore

Kilometre points

Grid soil bore

Open - Cut

Trenchless

Total Study Area

Construction Footprint

Watercourse

Waterbody

Analytical Results:

TAA - Titratable Actual Acidity
(% pyrite S)

CRS - Chromium Reducible Sulfur (%S)

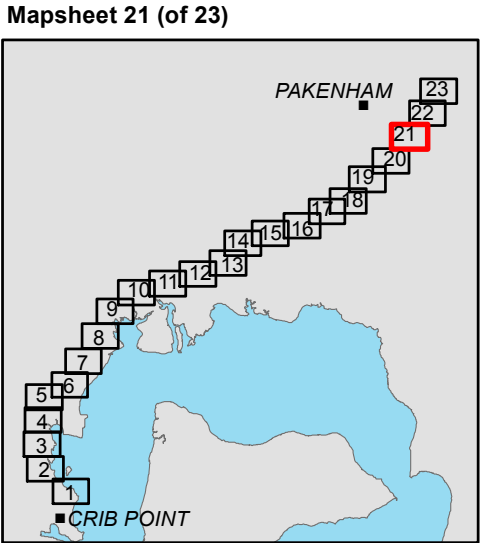
NA - Net Acidity (sulfur unit) (%S)

LR - Liming Rate (Kilogram CaCO3/ tonne)

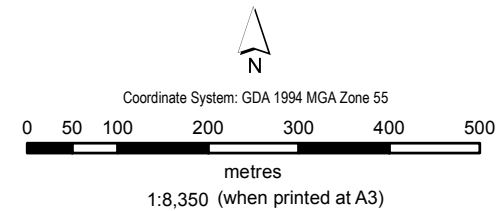
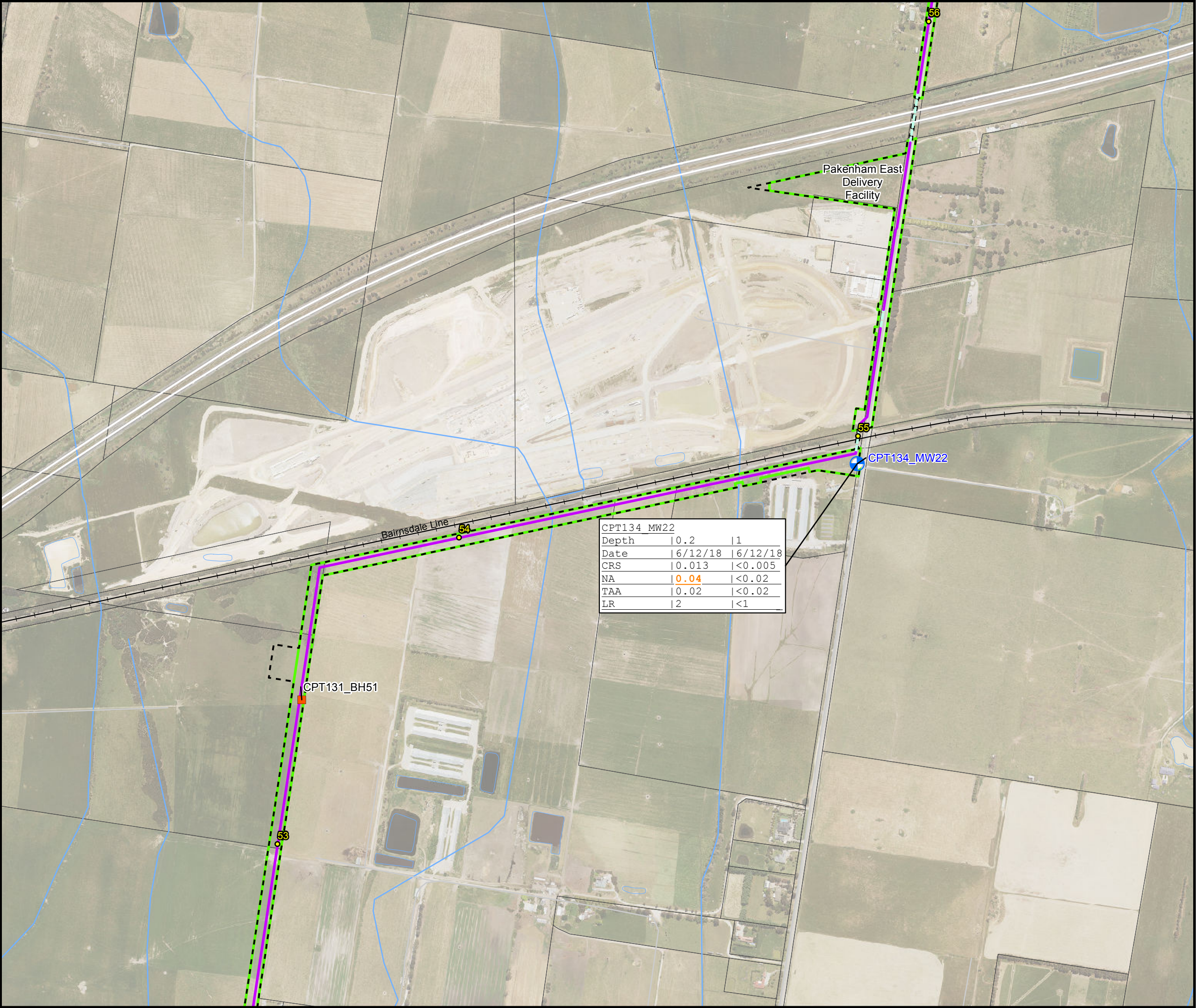
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples
BH209 and BH34 were classified as
PASS based on the SPOCAS data.



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- LEGEND**
- Groundwater monitoring bore
 - Kilometre points
 - Grid soil bore
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Rail
 - Watercourse
 - Waterbody

Analytical Results:
TAA - Titratable Actual Acidity (% pyrite S)
CRS - Chromium Reducible Sulfur (%S)
NA - Net Acidity (sulfur unit) (%S)
LR - Liming Rate (Kilogram CaCO3/ tonne)
PASS - Potential Acid Sulfate Soil

0.04: Exceeding guidelines

Conservatively, both samples BH209 and BH34 were classified as PASS based on the SPOCAS data.

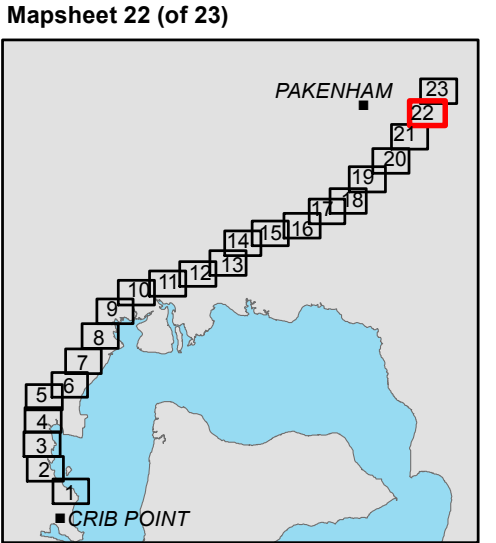
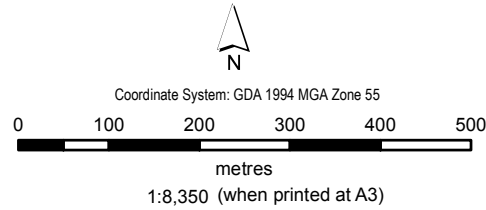




Figure
A6-23

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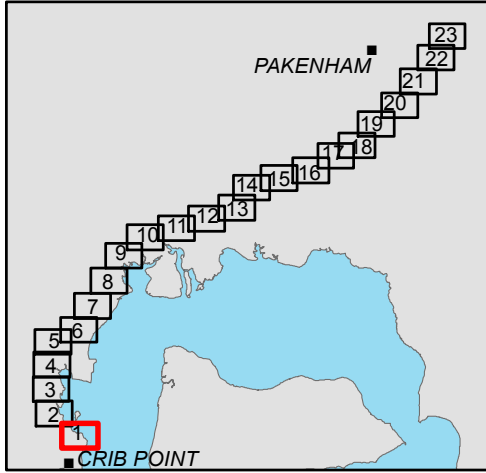
- LEGEND**
- Grid soil bore
 - Targeted soil bore analysed for PFAS
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Crib Point Receiving Facility
 - Construction Footprint
 - Waterbody

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

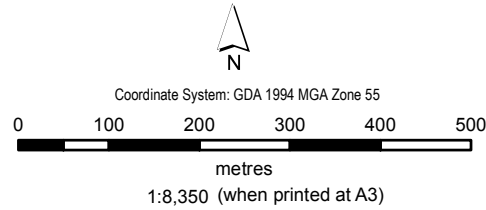
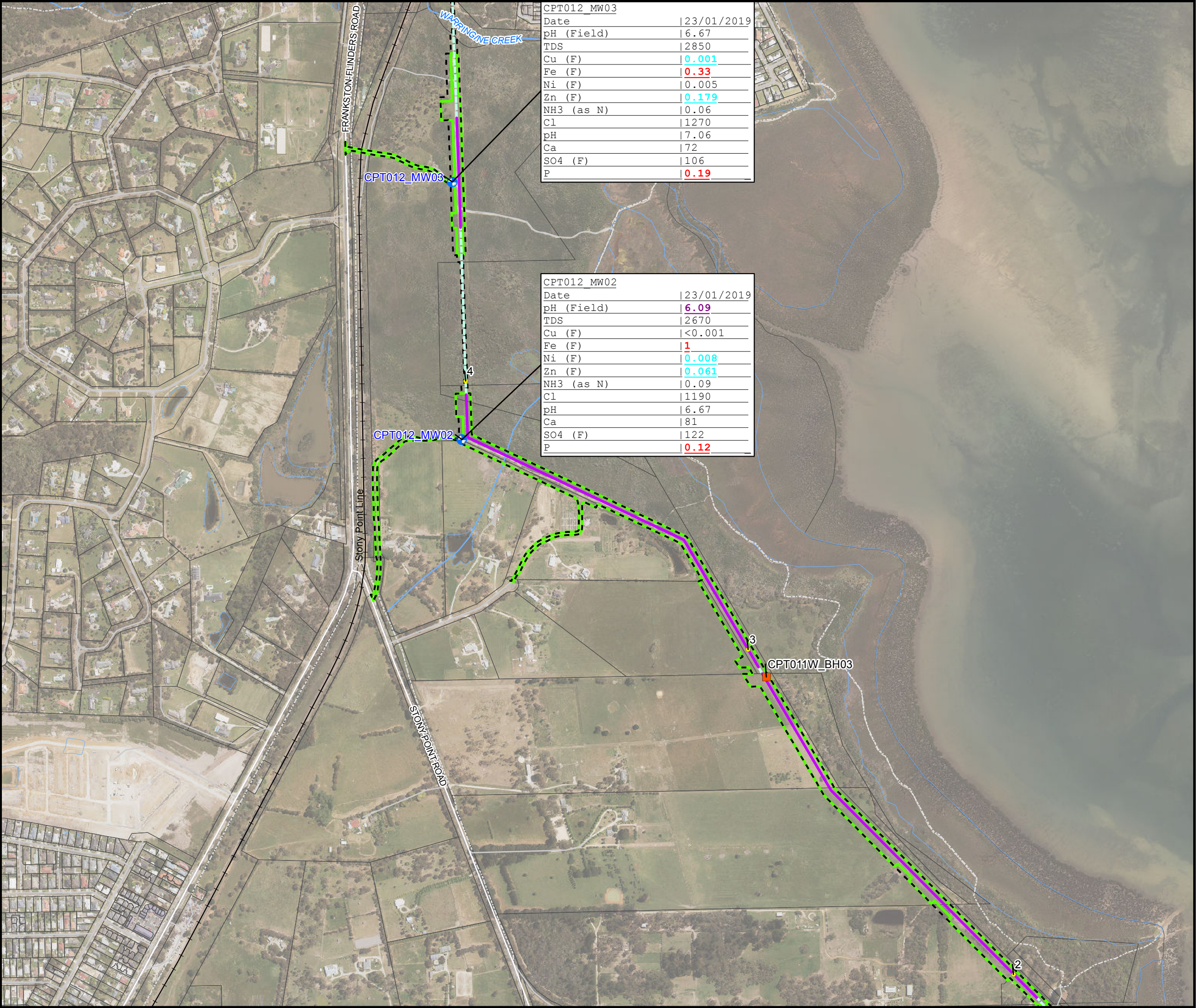
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 1 (of 23)

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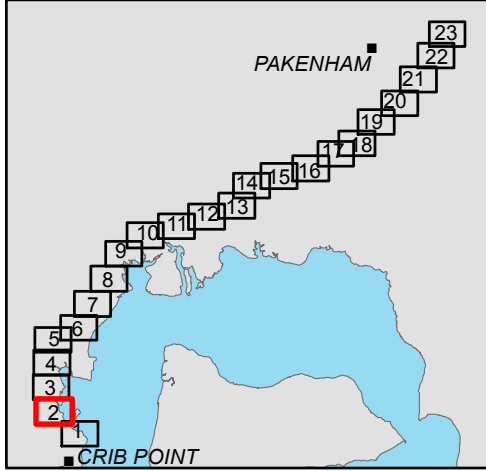
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

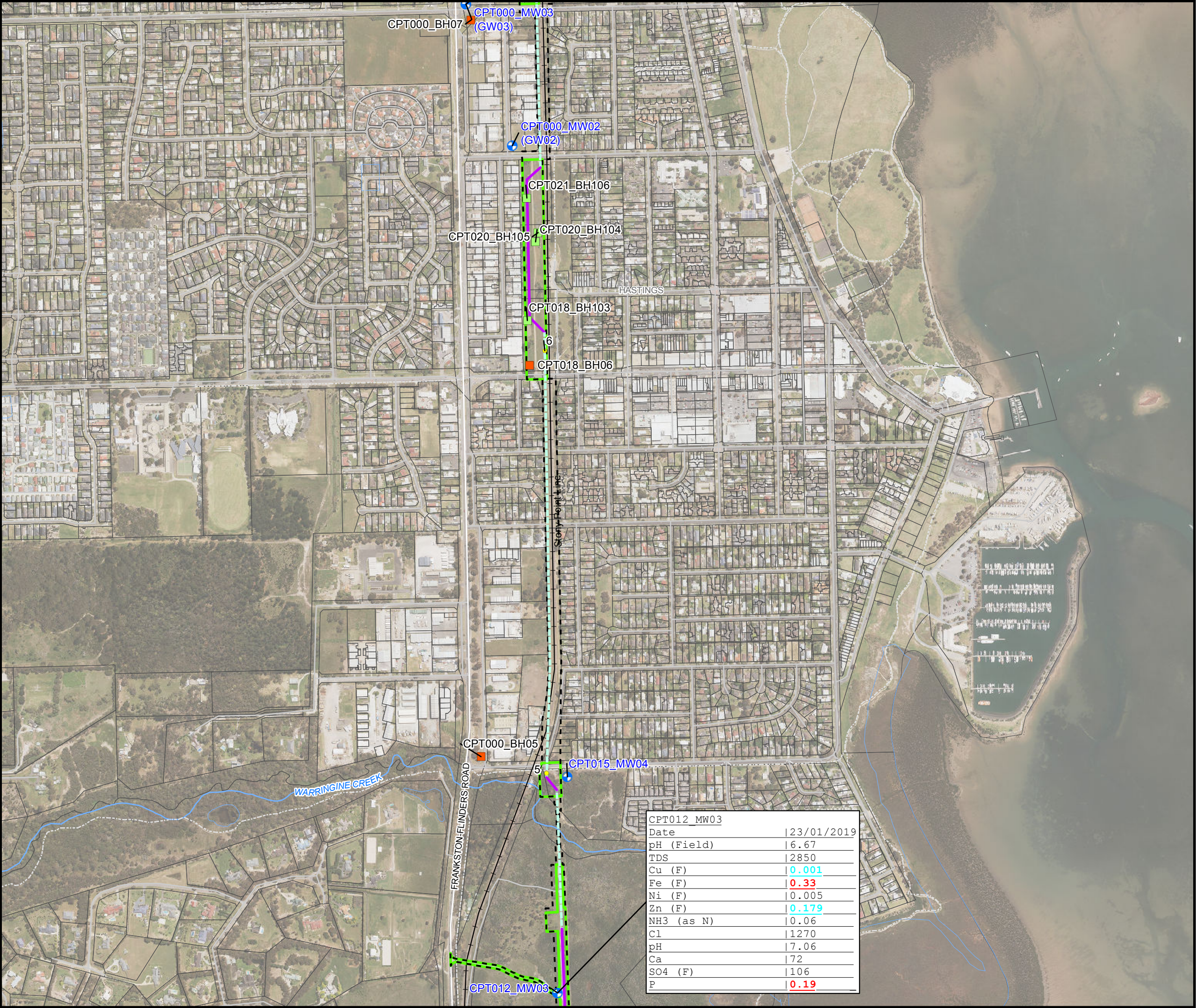
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%

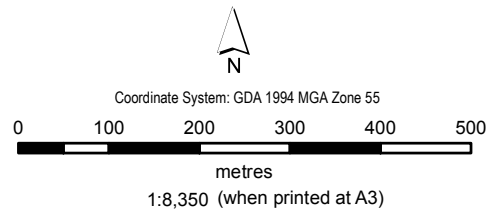


Contaminated groundwater results – exceedances
Pipeline - Mapsheet 2 (of 23)

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CREATED BY sam.schroder
LAST MODIFIED sam.schroder 26 MAY 2020
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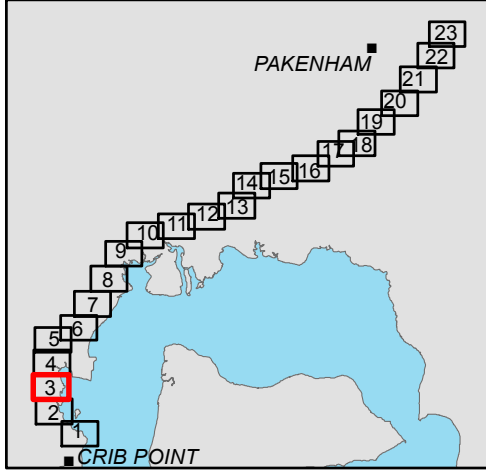
- LEGEND**
- Grid soil bore
 - Targeted soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH3 - Ammonia
Cl - Chlorine
Ca - Calcium
SO4 - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 3 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

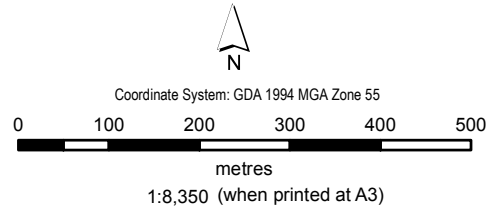
Figure
A7-3

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CPT022W MW05	
Date	25/01/2019
pH (Field)	6.13
TDS	5320
Cu (F)	<0.001
Fe (F)	1.95
Ni (F)	0.005
Zn (F)	0.047
NH3 (as N)	0.17
Cl	2950
pH	7.19
Ca	170
SO4 (F)	129
P	0.09

CPT000 MW03	
Date	27/02/2019
TDS	6310
Cu (F)	<0.001
Fe (F)	<0.05
Ni (F)	0.002
Zn (F)	0.016
NH3 (as N)	0.14
Cl	3460
pH	6.9
Ca	179
SO4 (F)	364
P	0.06



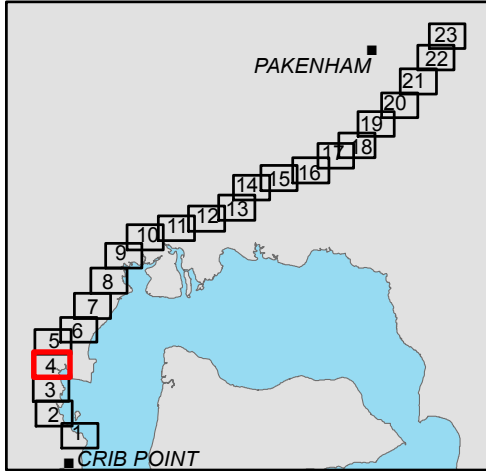
- LEGEND**
- Grid soil bore
 - Targeted soil bore
 - Targeted soil bore analysed for PFAS
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH3 - Ammonia
Cl - Chlorine
Ca - Calcium
SO4 - Sulfates
P - Phosphorus

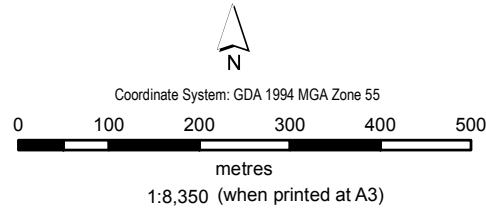
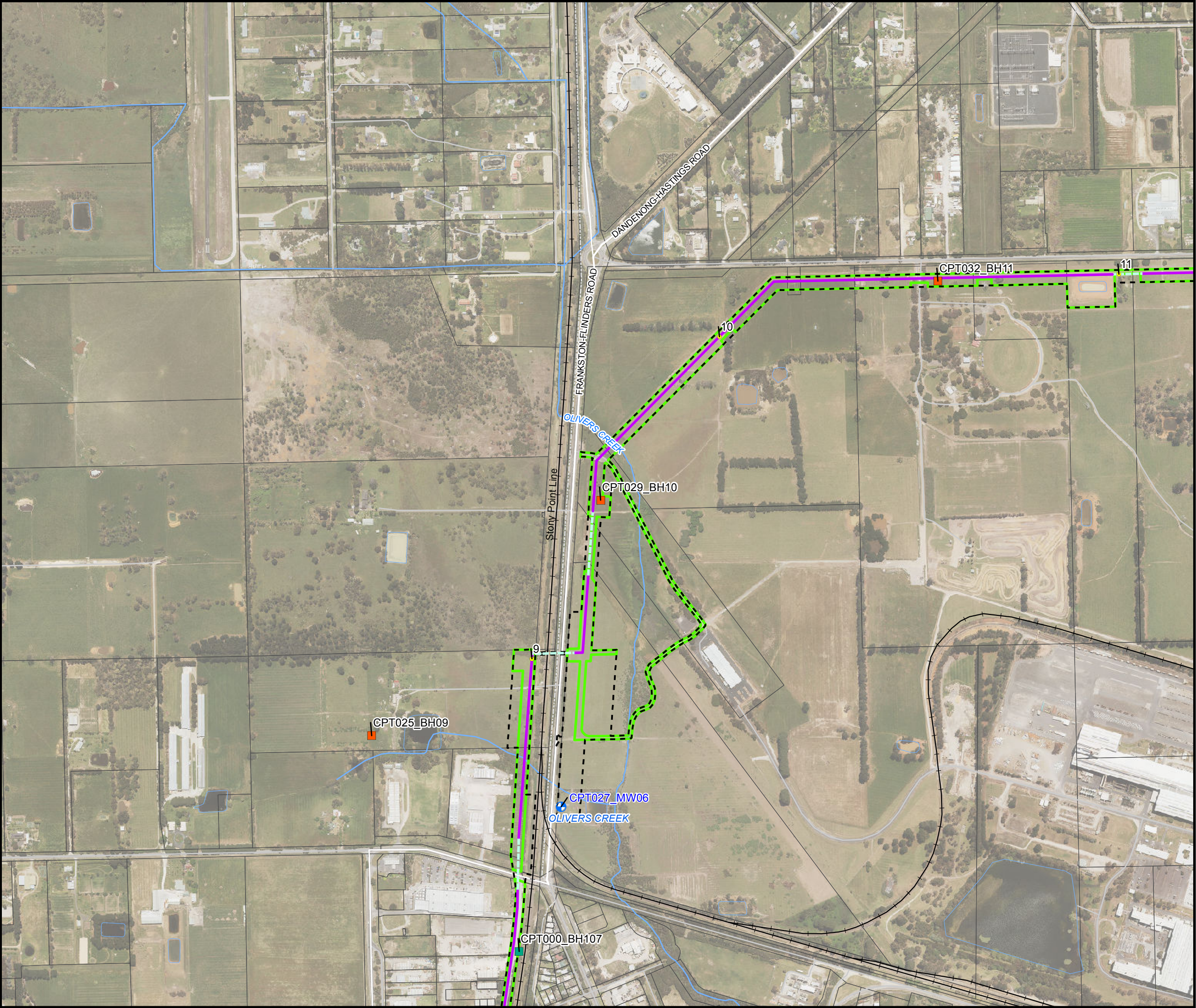
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 4 (of 23)

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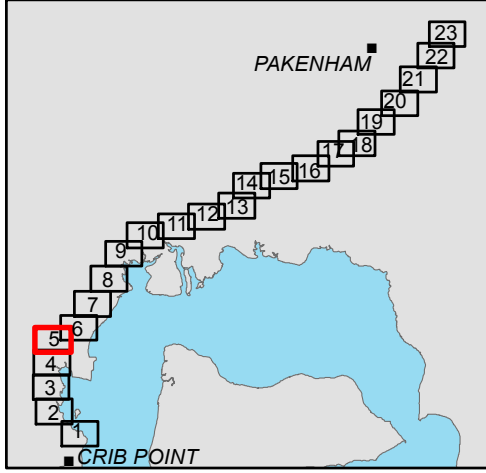
- LEGEND**
- Grid soil bore
 - Targeted soil bore analysed for PFAS
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

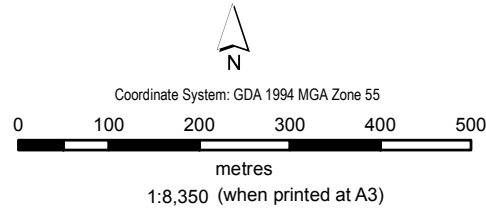
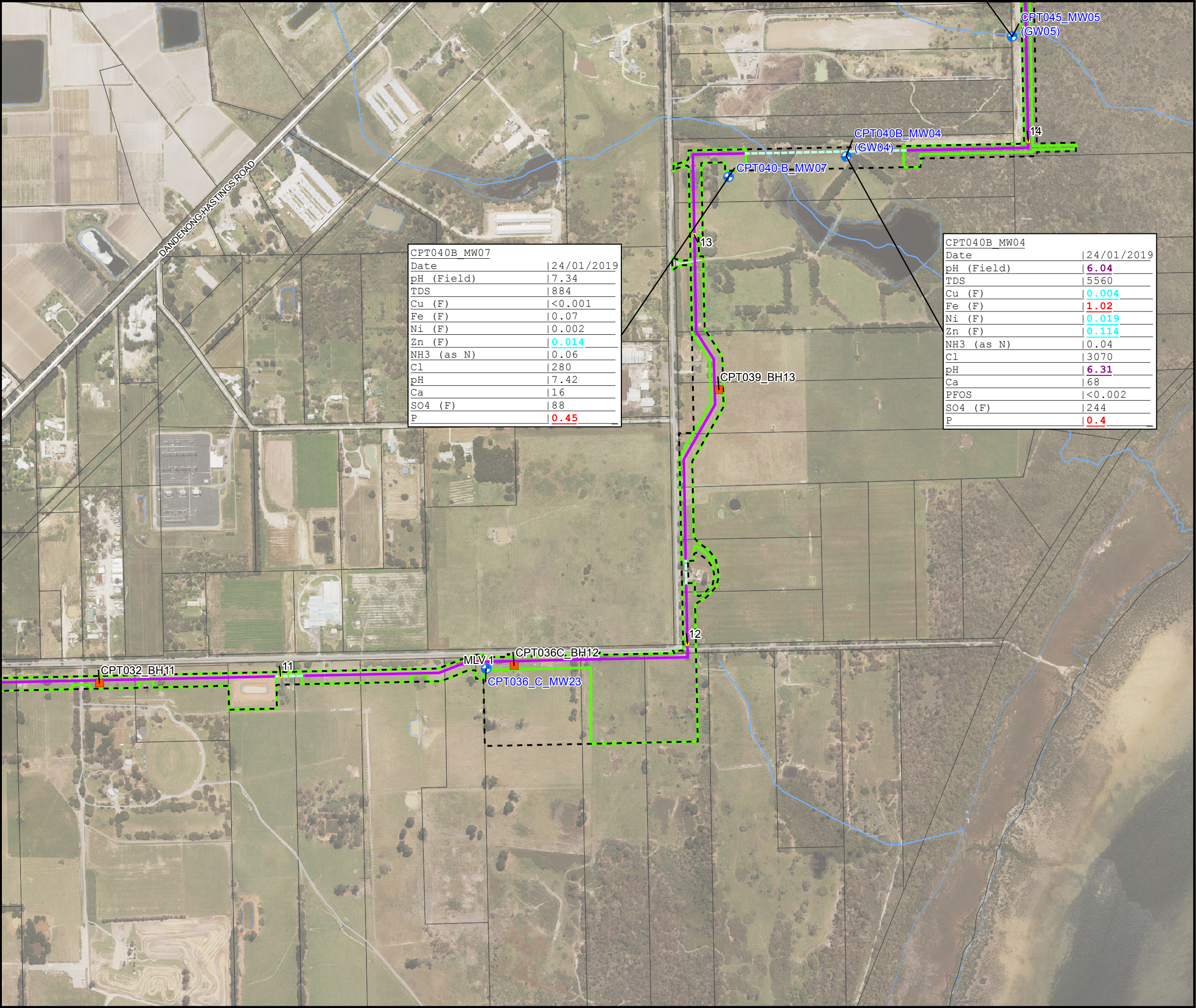
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 5 (of 23)

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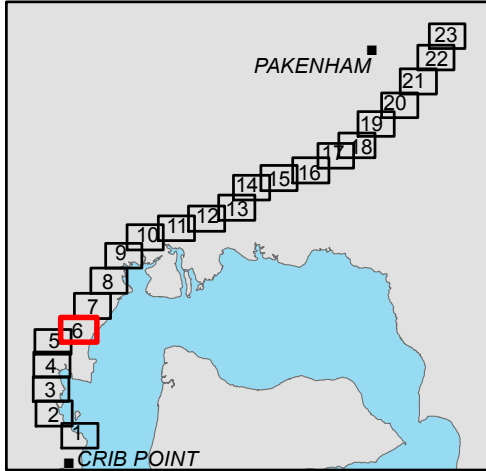
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - MLV 1
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH3 - Ammonia
Cl - Chlorine
Ca - Calcium
SO4 - Sulfates
P - Phosphorus

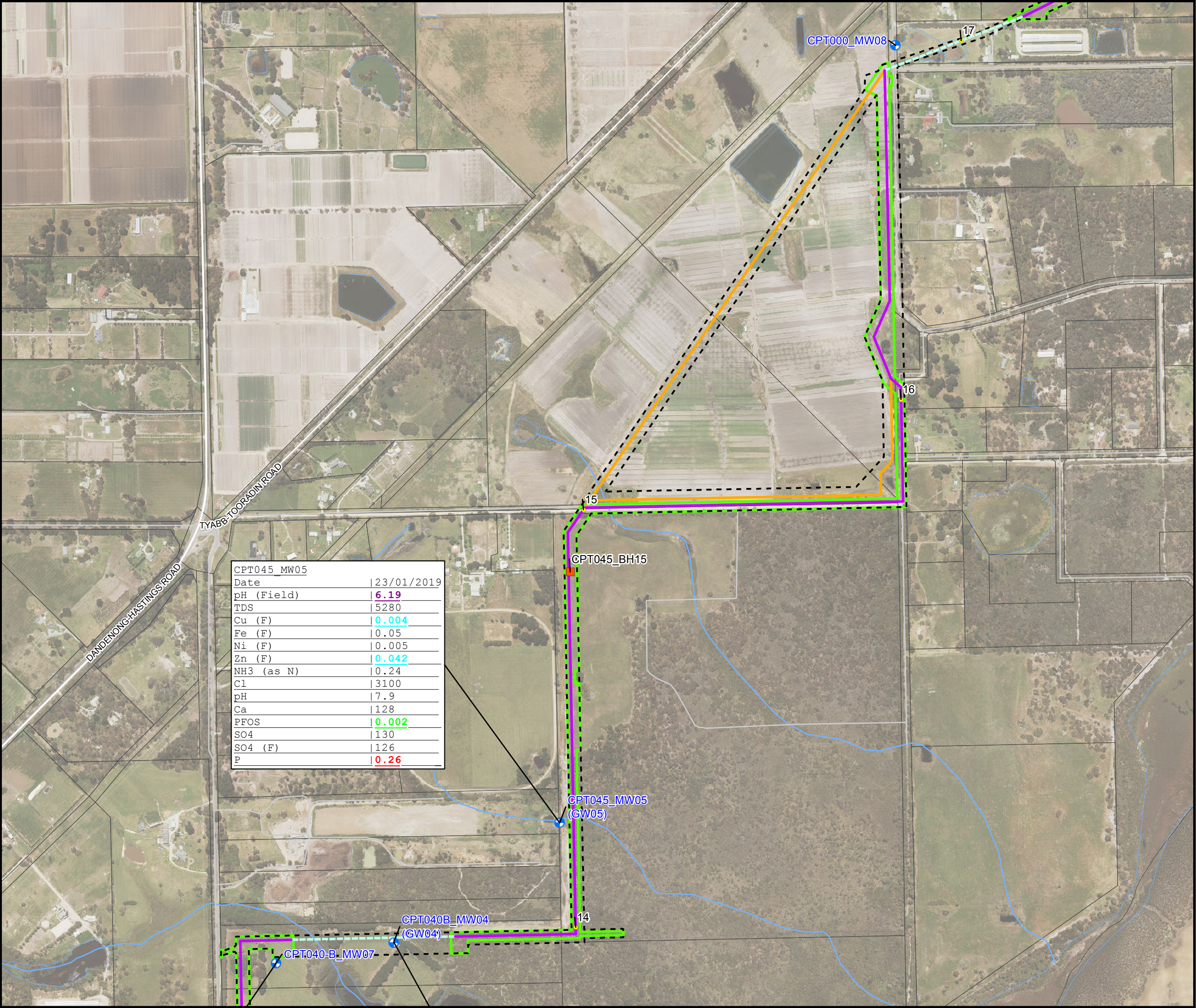
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 6 (of 23)

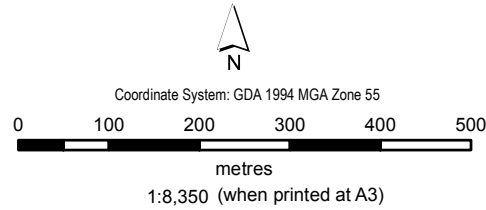
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CPT045_MW05	
Date	23/01/2019
pH (Field)	6.19
TDS	5280
Cu (F)	0.004
Fe (F)	0.05
Ni (F)	0.005
Zn (F)	0.042
NH3 (as N)	0.24
Cl	3100
pH	7.9
Ca	128
PFOS	0.002
SO4	130
SO4 (F)	126
P	0.26

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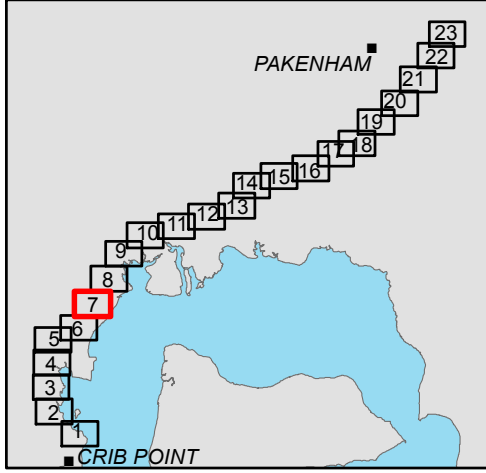
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH3 - Ammonia
Cl - Chlorine
Ca - Calcium
SO4 - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%

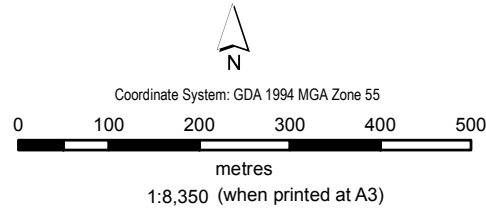


Contaminated groundwater results – exceedances
Pipeline - Mapsheet 7 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

Figure
A7-7

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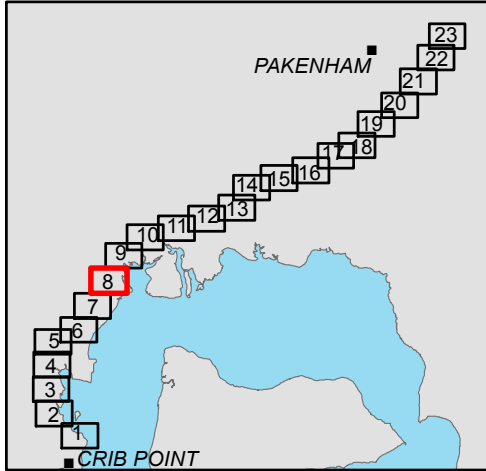
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 8 (of 23)

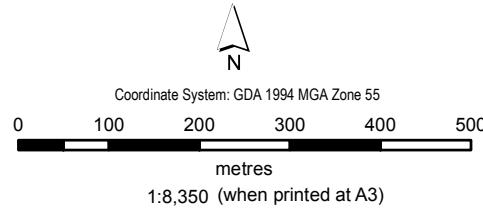
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CPT000_MW11	
Date	23/01/2019
Total Dissolved Solids	18700
Cu (F)	0.009
Fe (F)	0.26
Ni (F)	0.009
Zn (F)	0.072
NH3 (as N)	0.31
Cl	10300
pH	6.67
Ca	1270
SO4 (F)	1170
P	0.39

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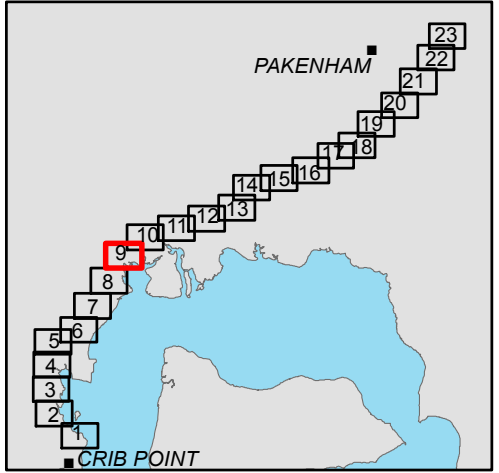
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH3 - Ammonia
Cl - Chlorine
Ca - Calcium
SO4 - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%

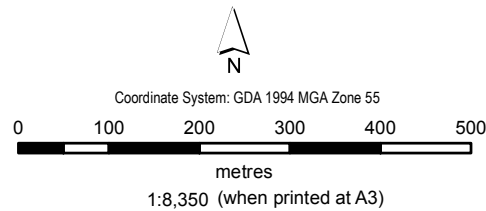


Contaminated groundwater results – exceedances
Pipeline - Mapsheet 9 (of 23)

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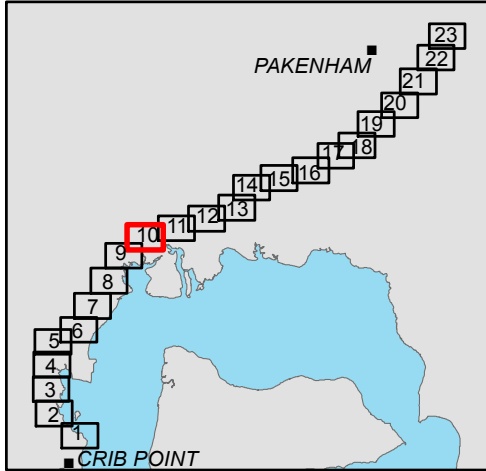
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

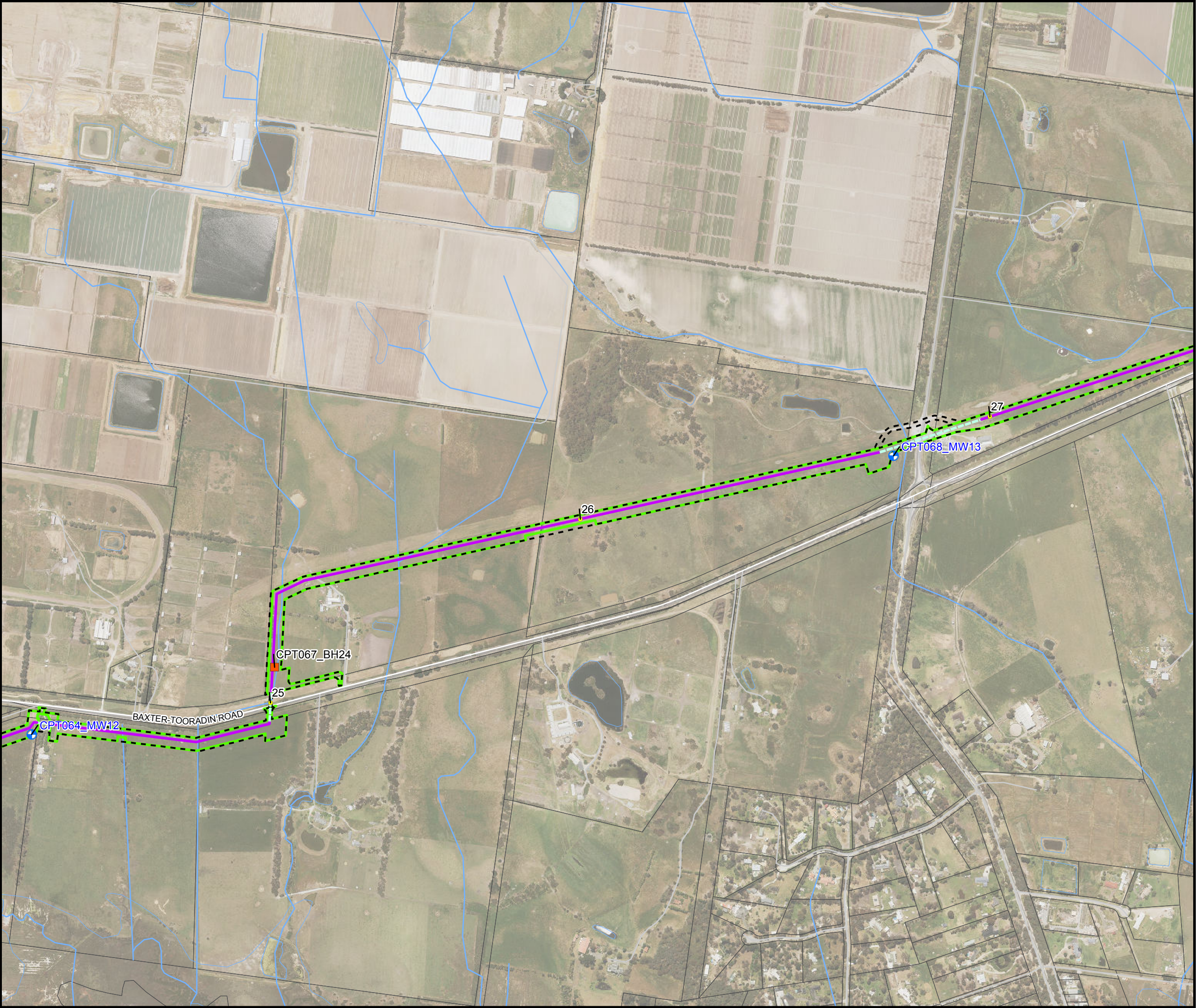
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



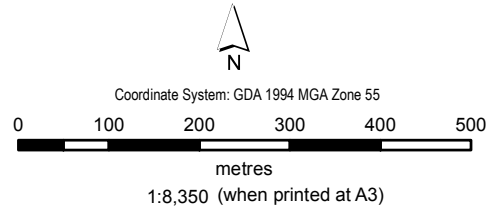
Contaminated groundwater results – exceedances
Pipeline - Mapsheet 10 (of 23)

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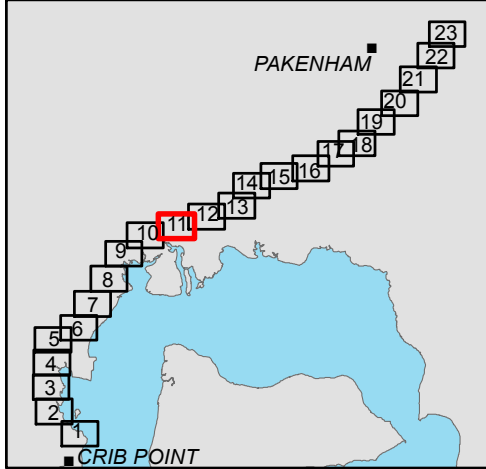
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

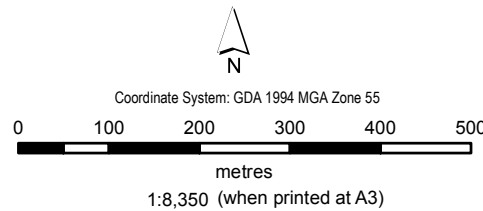
TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 11 (of 23)



- LEGEND
- Grid soil bore

Groundwater monitoring bore

Kilometre points

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

Waterbody

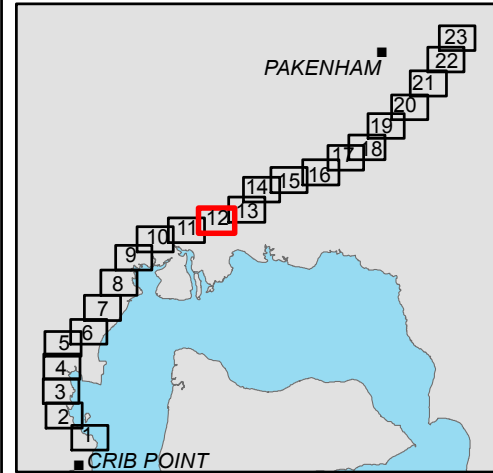
Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

Guideline Exceedances:

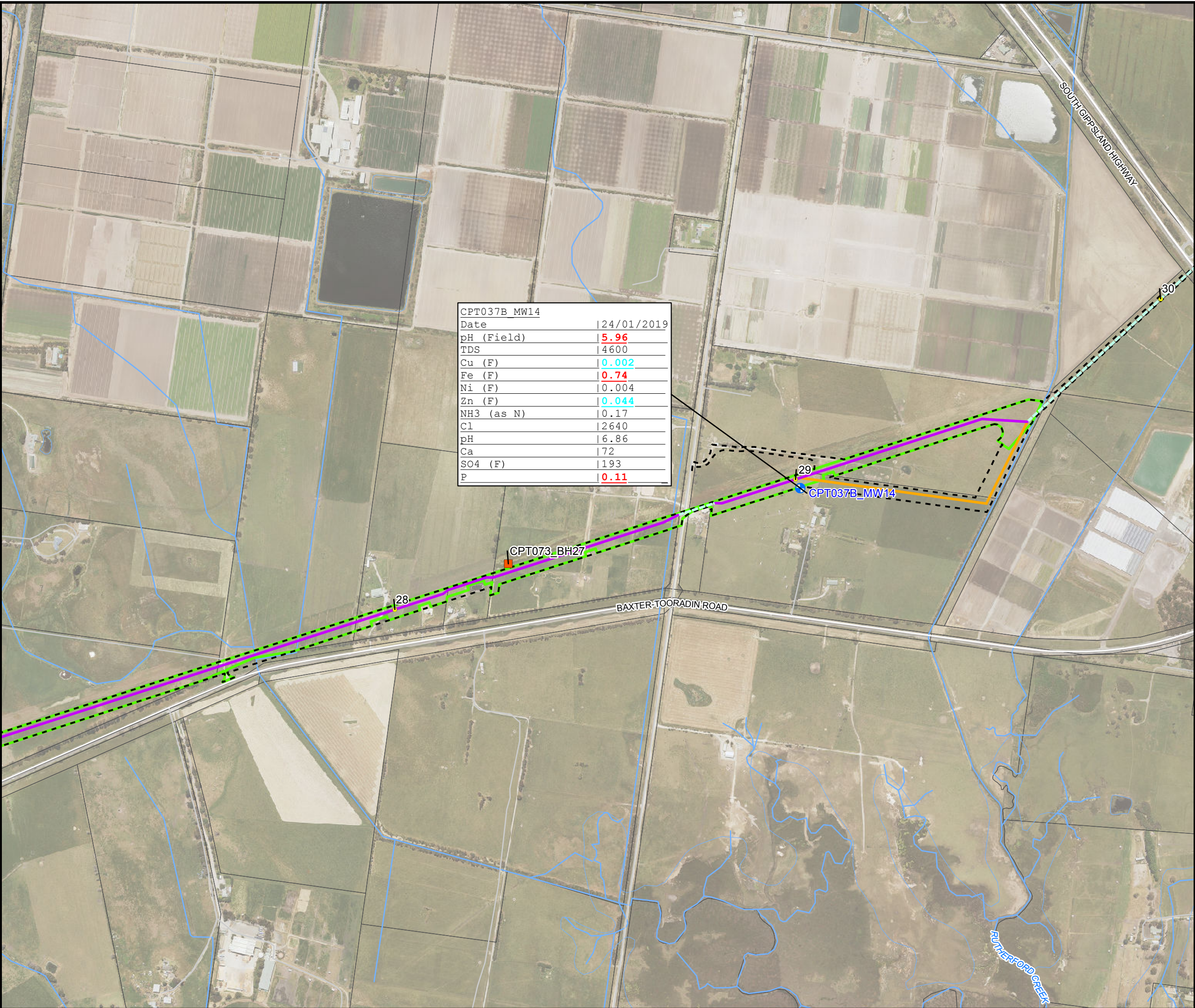
340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances

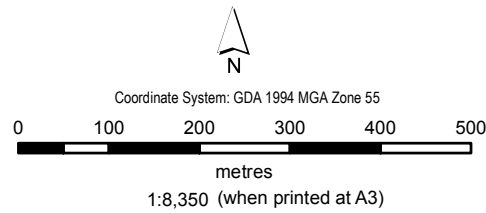
Pipeline - Mapsheet 12 (of 23)

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CPT037B_MW14	
Date	24/01/2019
pH (Field)	5.96
TDS	4600
Cu (F)	0.002
Fe (F)	0.74
Ni (F)	0.004
Zn (F)	0.044
NH3 (as N)	0.17
Cl	2640
pH	6.86
Ca	72
SO4 (F)	193
P	0.11

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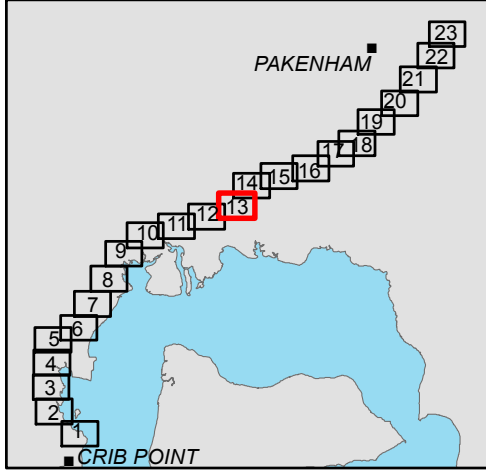
- LEGEND**
- Grid soil bore
 - Targeted acid sulfate soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

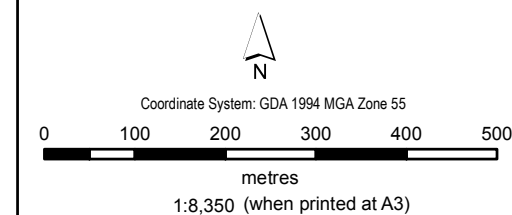
TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH3 - Ammonia
Cl - Chlorine
Ca - Calcium
SO4 - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 13 (of 23)



- LEGEND
- Grid soil bore

Targeted acid sulfate soil bore

Groundwater monitoring bore

Kilometre points

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

Waterbody

Watercourse

Rail disused/ dismantled/ rail trail

- Analytical Results:
- TDS - Total Dissolved Solids

Cu - Copper

Fe - Iron

Ni - Nickel

Zn - Zinc

NH₃ - Ammonia

Cl - Chlorine

Ca - Calcium

SO₄ - Sulfates

P - Phosphorus

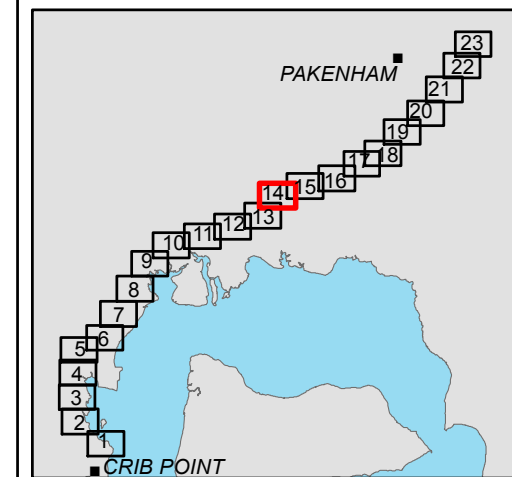
- Guideline Exceedances:
- 340 : ANZECC 2000 - Irrigation LTV

0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)

507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%

340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters

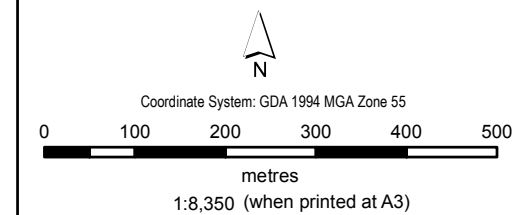
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances

Pipeline - Mapsheet 14 (of 23)

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- LEGEND
- Grid soil bore

Targeted acid sulfate soil bore

Kilometre points

Open - Cut

Trenchless

Pipeline Alignment Options

Total Study Area

Construction Footprint

Waterbody

Watercourse

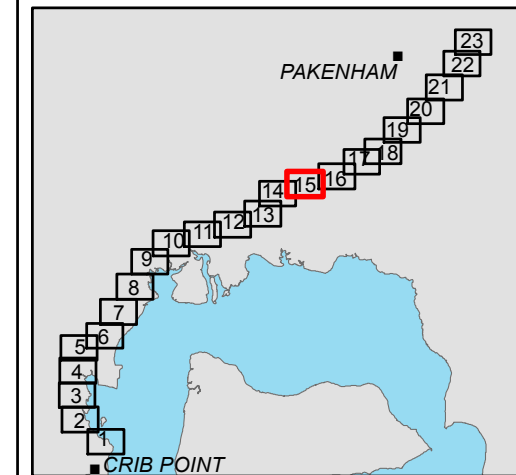
Rail disused/ dismantled/ rail trail

Analytical Results:

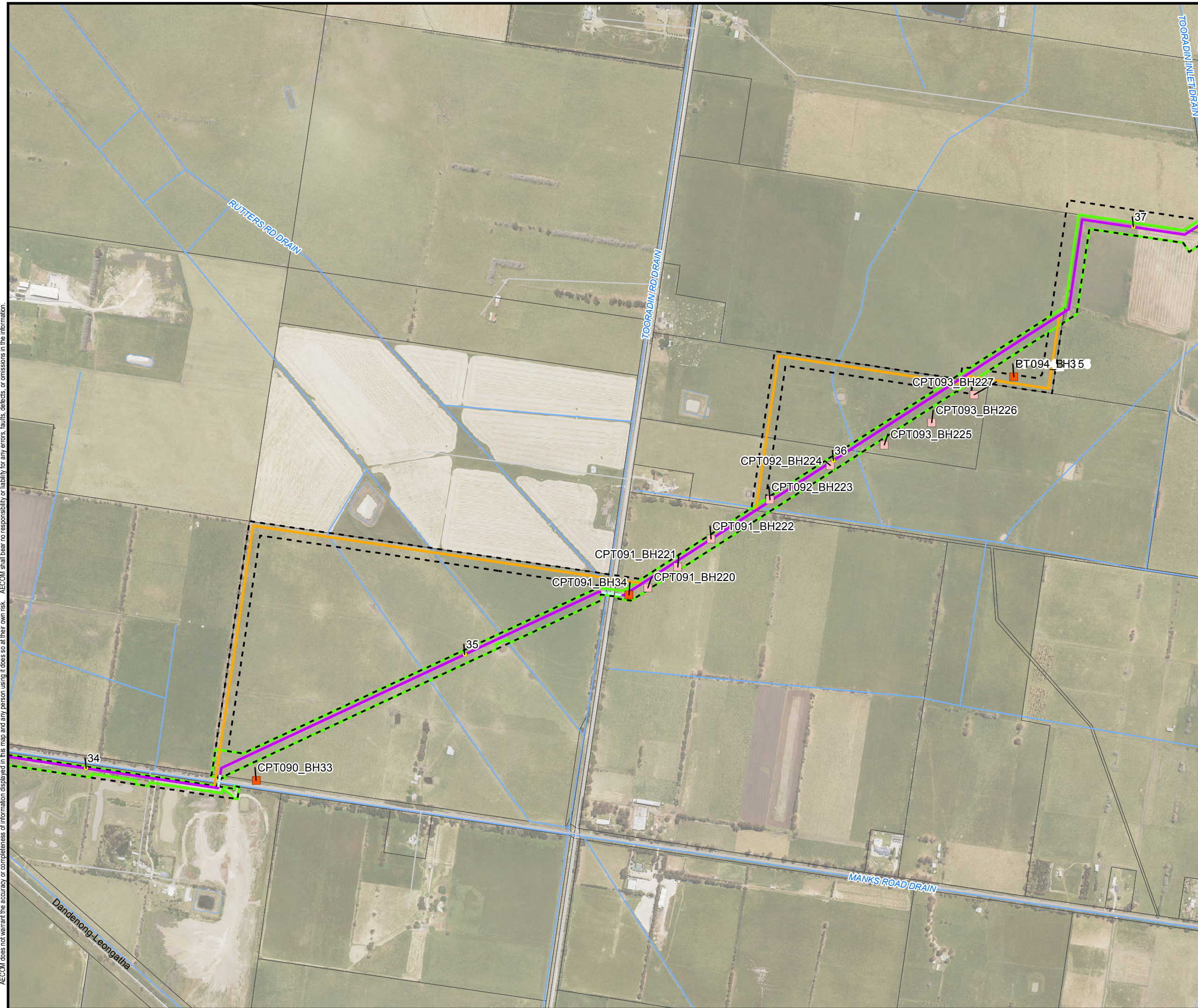
TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 15 (of 23)

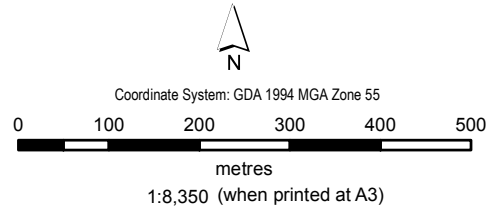


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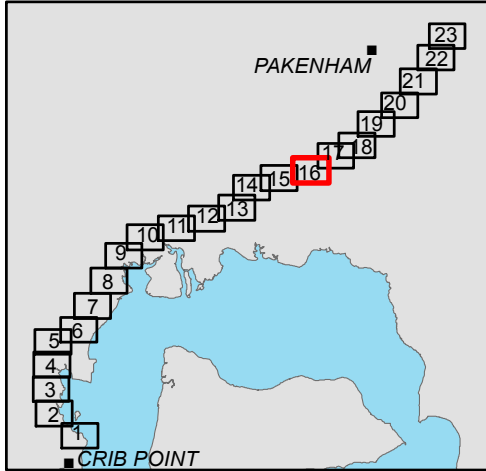
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

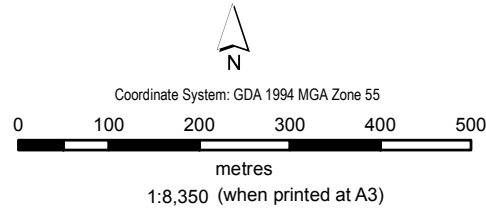
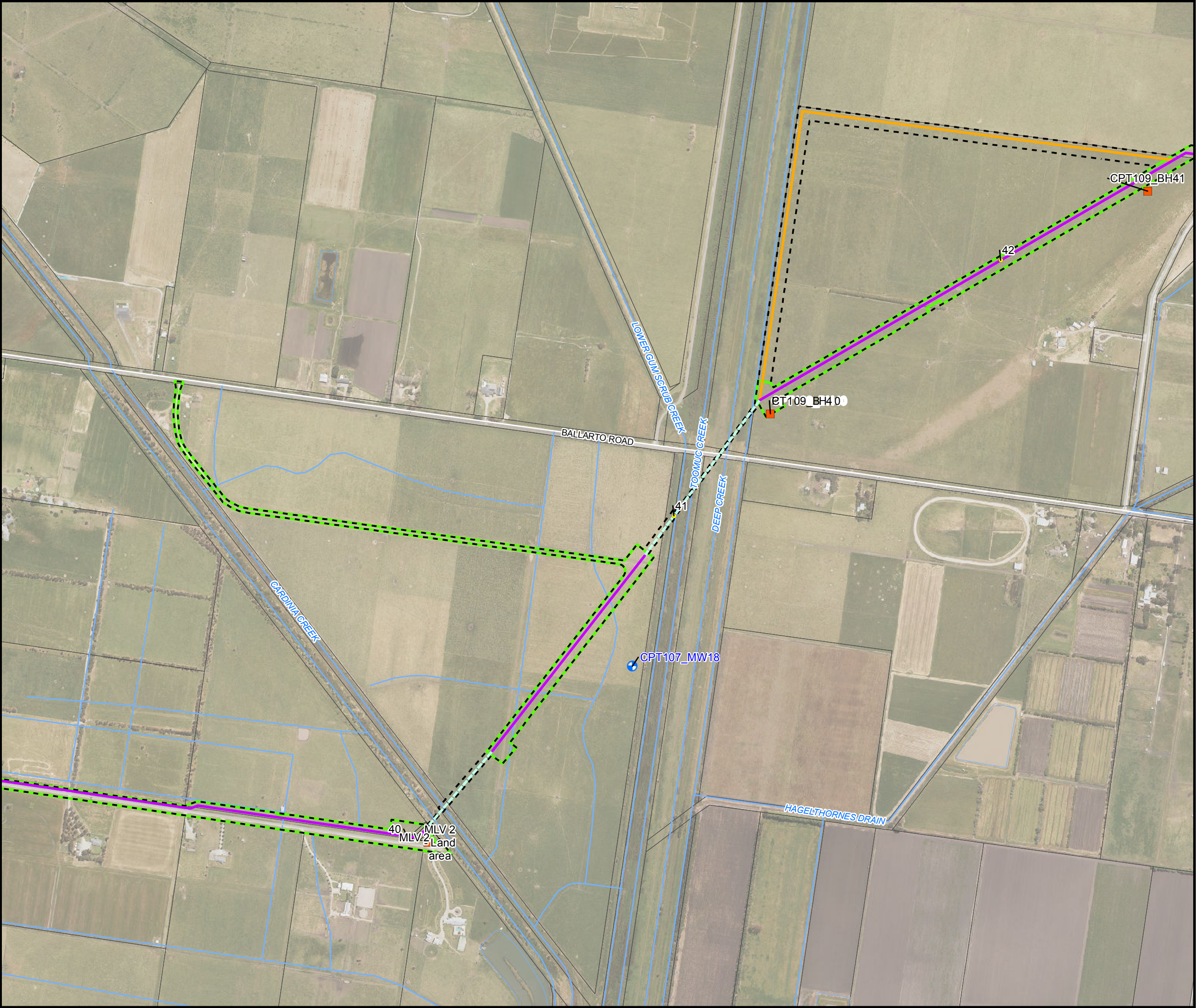
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 16 (of 23)

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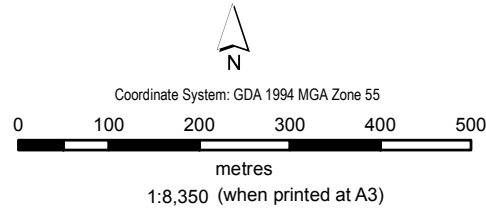
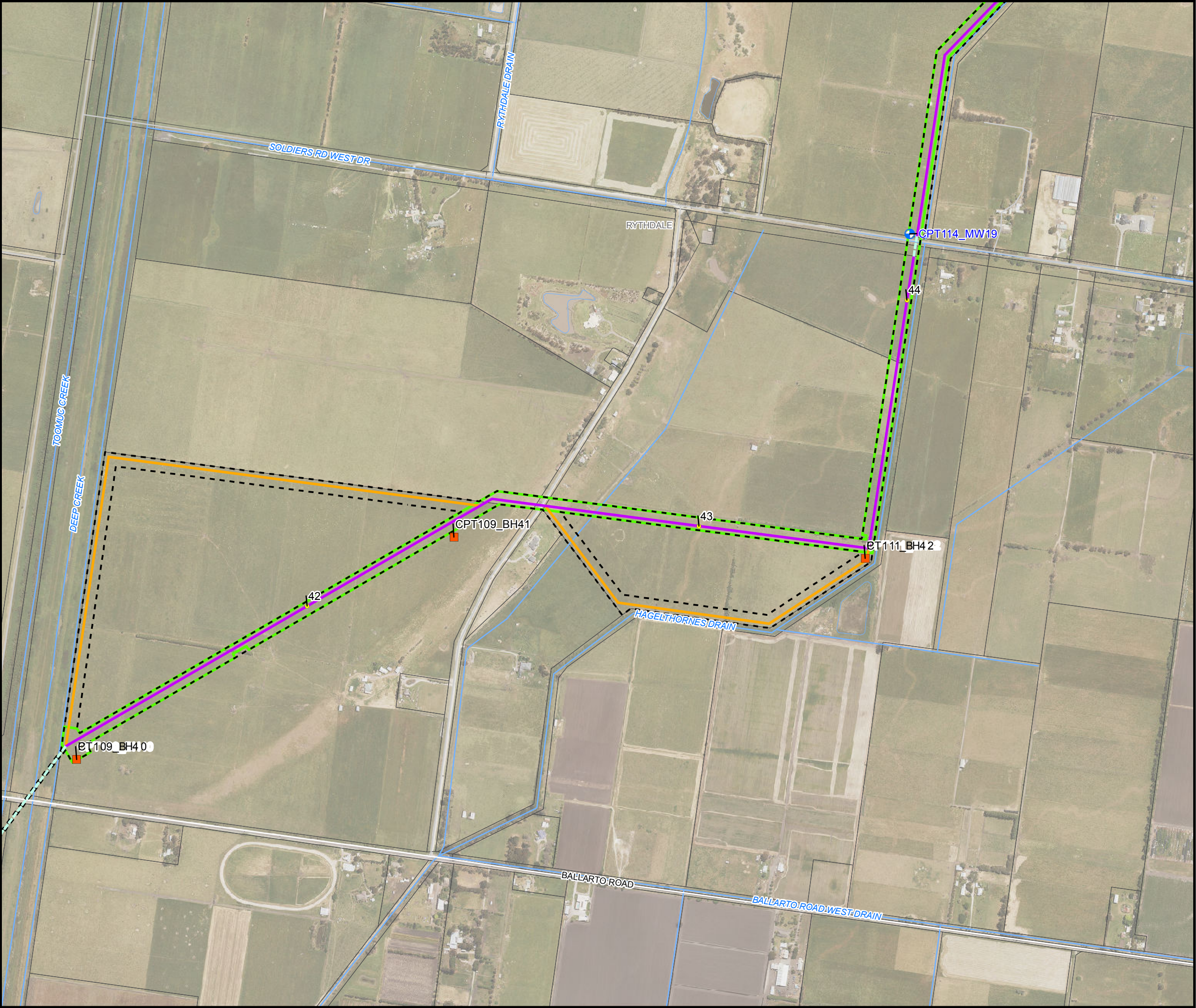
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - MLV 2
 - MLV 2 - Land area
 - Construction Footprint
 - Waterbody
 - Watercourse
- Analytical Results:**
- TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

- Guideline Exceedances:**
- 340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 17 (of 23)

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- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Pipeline Alignment Options
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

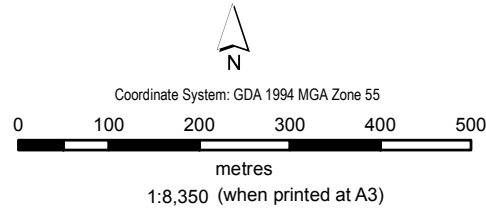
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
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0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 18 (of 23)

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- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

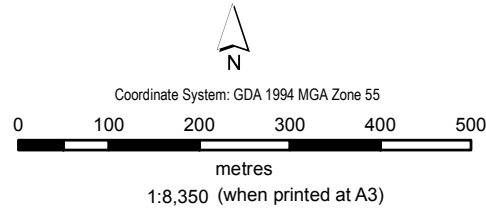
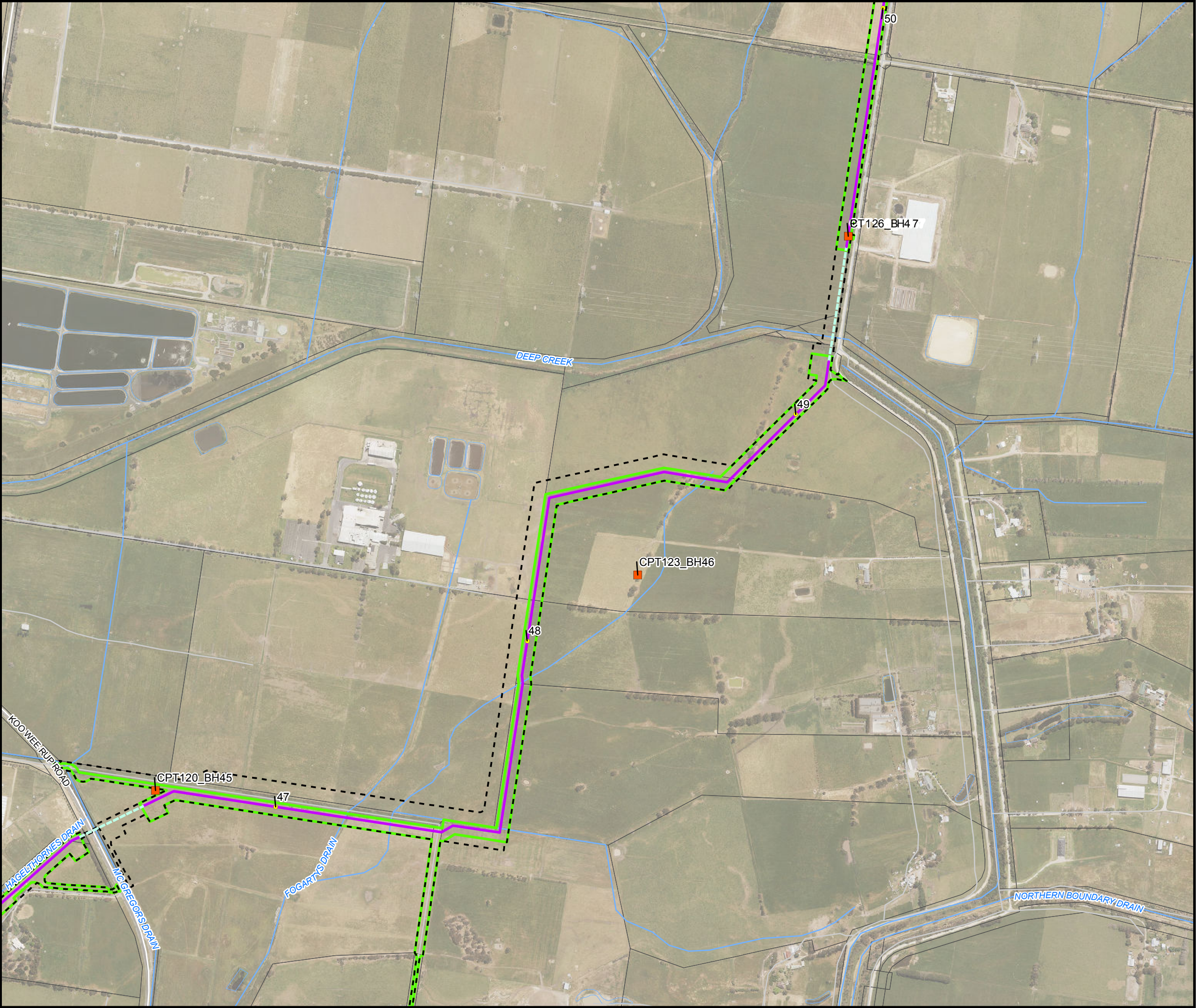
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 19 (of 23)

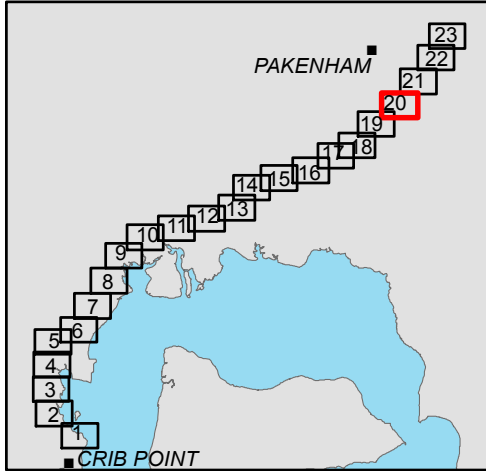
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- LEGEND**
- Grid soil bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

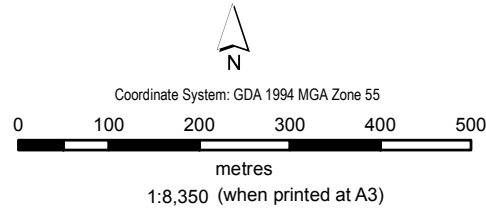
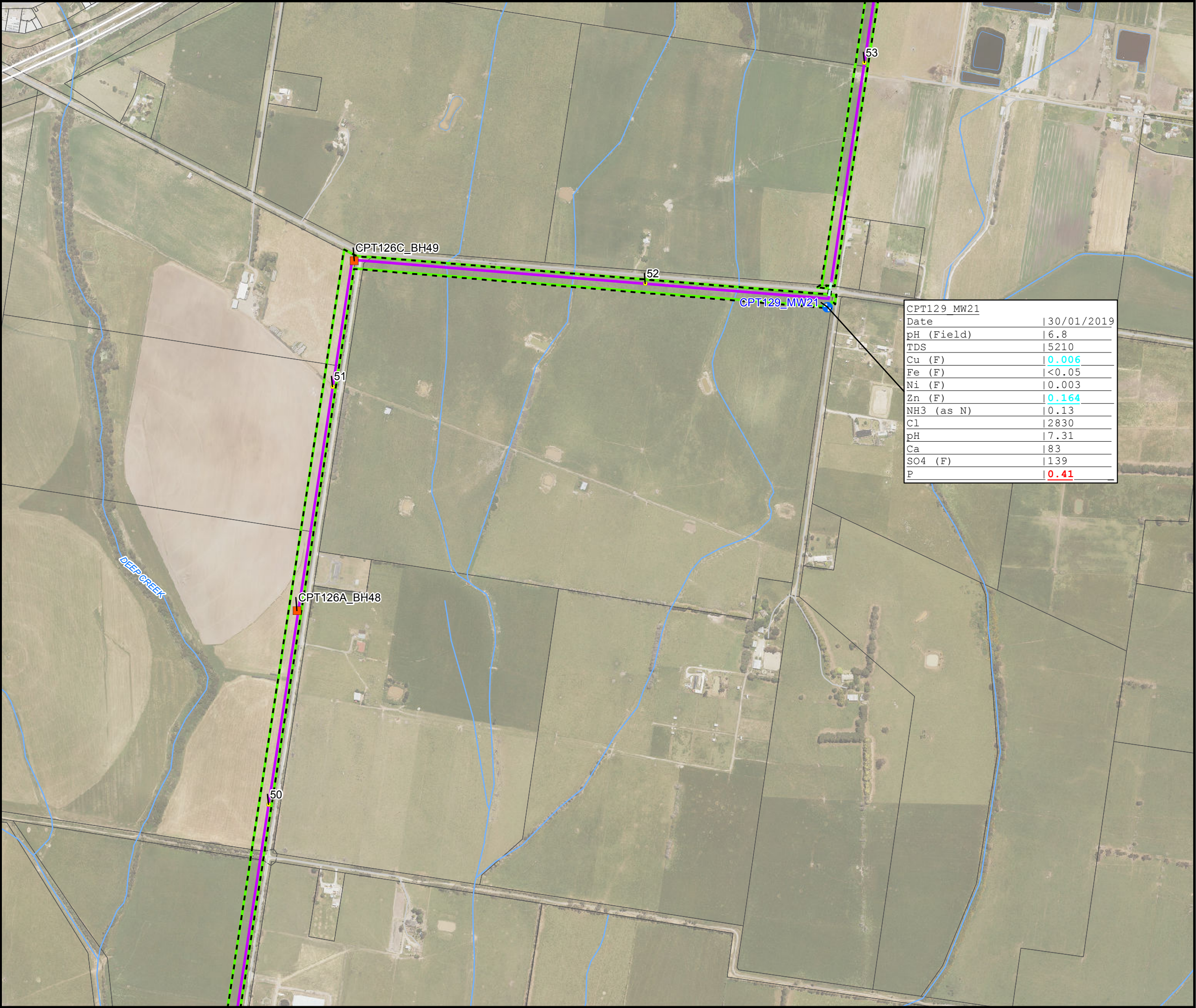
- Analytical Results:**
- TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

- Guideline Exceedances:**
- 340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
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Contaminated groundwater results – exceedances
Pipeline - Mapsheet 20 (of 23)

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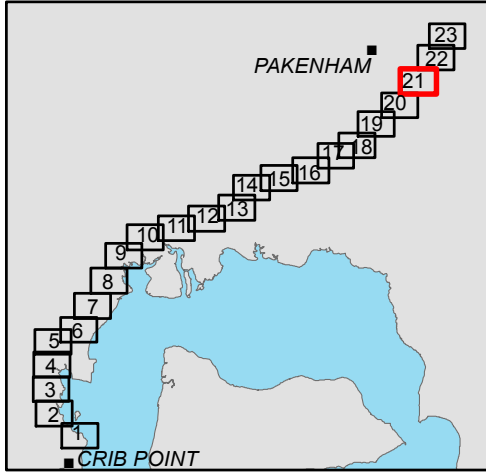
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

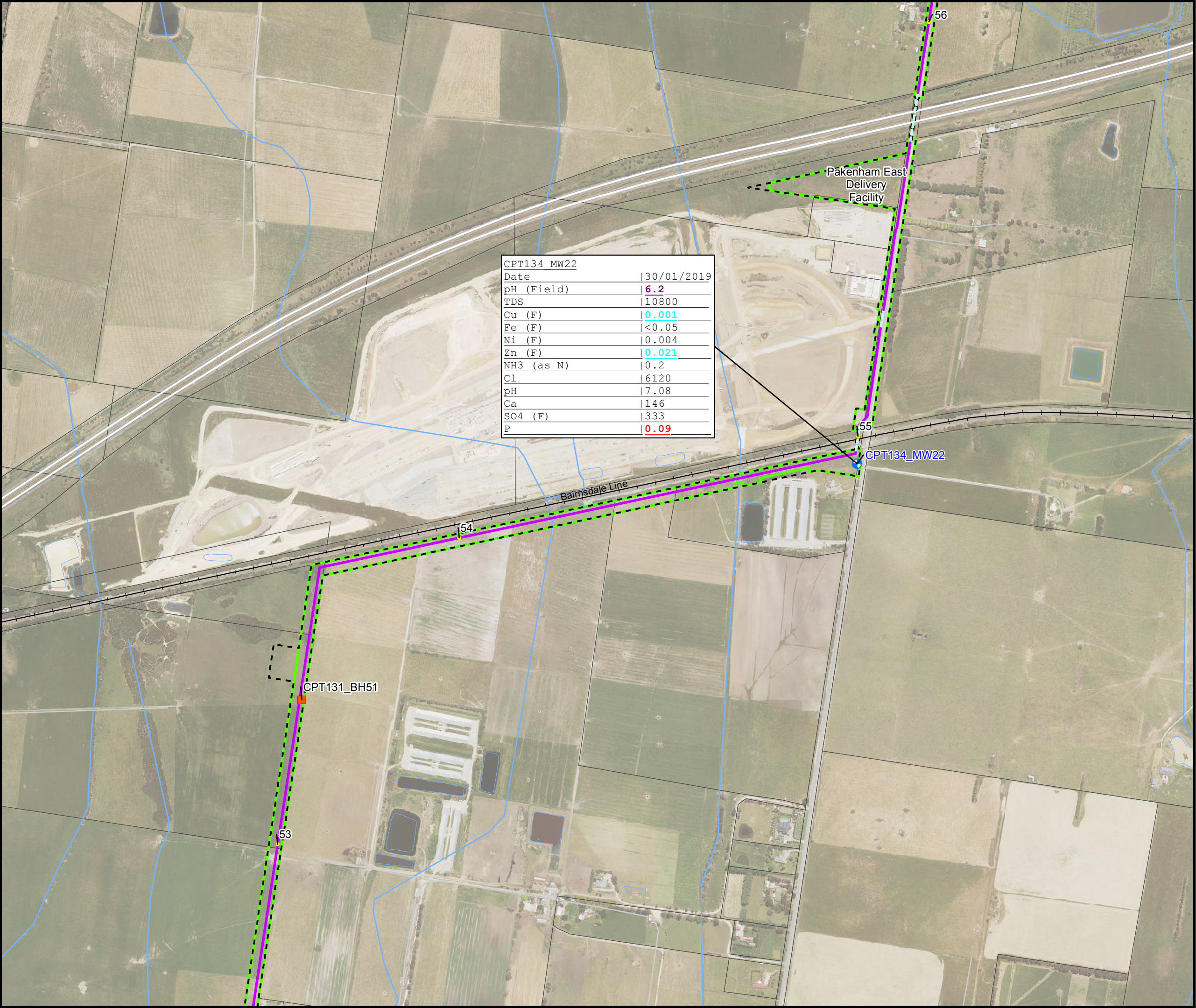
Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



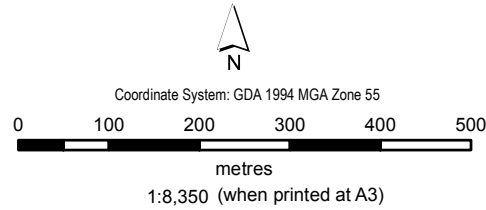
Contaminated groundwater results – exceedances
Pipeline - Mapsheet 21 (of 23)

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CPT134 MW22	
Date	30/01/2019
pH (Field)	6.2
TDS	10800
Cu (F)	0.001
Fe (F)	<0.05
Ni (F)	0.004
Zn (F)	0.021
NH3 (as N)	0.2
Cl	6120
pH	7.08
Ca	146
SO4 (F)	333
P	0.09

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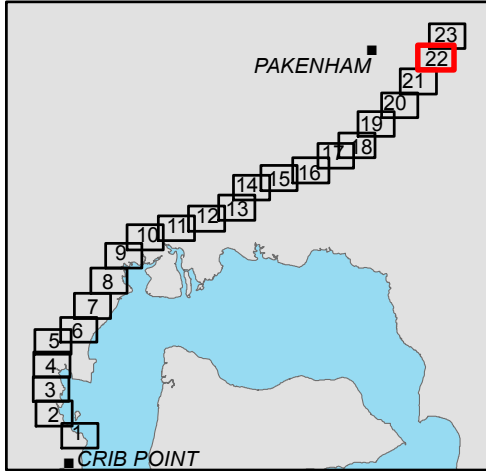
- LEGEND**
- Grid soil bore
 - Groundwater monitoring bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse
 - Rail

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
Ni - Nickel
Zn - Zinc
NH₃ - Ammonia
Cl - Chlorine
Ca - Calcium
SO₄ - Sulfates
P - Phosphorus

Guideline Exceedances:

340 : ANZECC 2000 - Irrigation LTV
0.04 : ANZECC 2000 - Livestock Watering (Beef cattle, poultry, sheep)
507 : NEMP 2018 - PFAS Guidelines Freshwater Marine 99%
340 : NHMRC 2008 - Guidelines for Managing Risks in Recreational Waters
0.04 : ANZECC 2000 - Maintenance of Ecosystems Marine Water 99%



Contaminated groundwater results – exceedances
Pipeline - Mapsheet 22 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

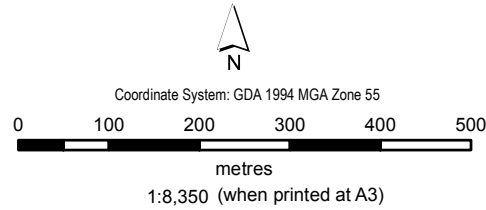
Figure
A7-22

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CPT134_MW22
Date 13/01/2019

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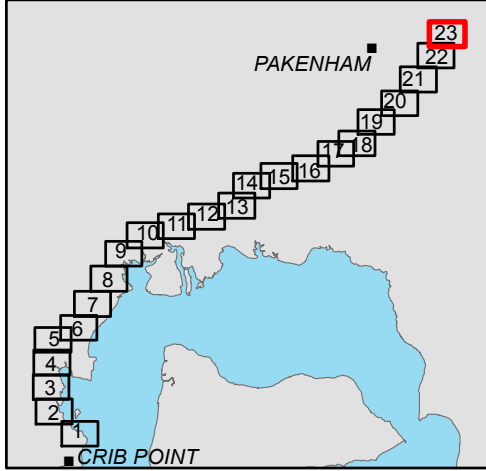
- LEGEND**
- Grid soil bore
 - Kilometre points
 - Open - Cut
 - Trenchless
 - Total Study Area
 - Construction Footprint
 - Waterbody
 - Watercourse

Analytical Results:

TDS - Total Dissolved Solids
Cu - Copper
Fe - Iron
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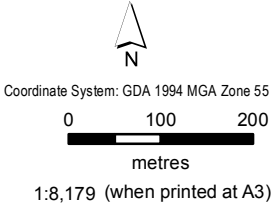
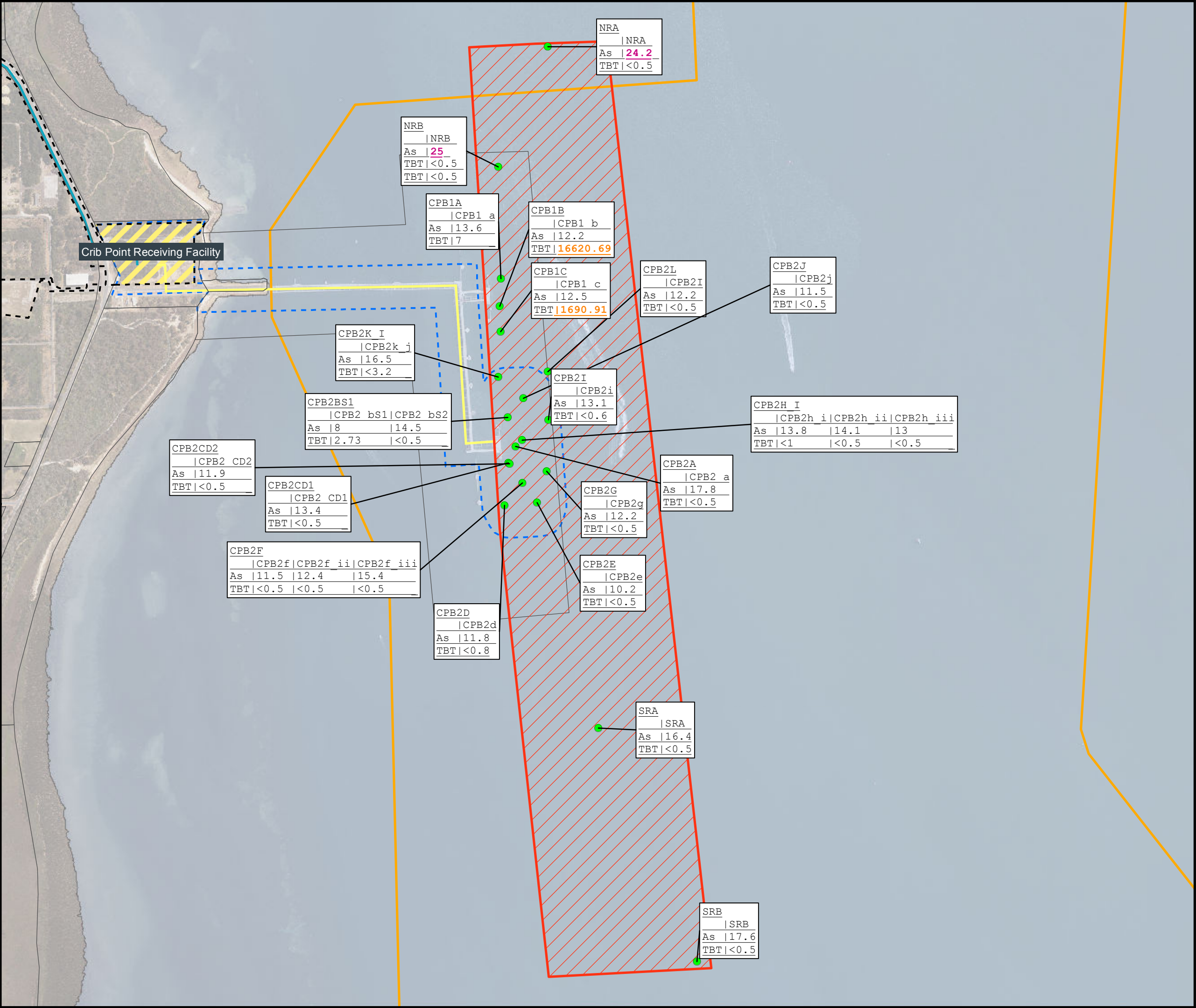


Contaminated groundwater results – exceedances
Pipeline - Mapsheet 23 (of 23)

APA
Gas Import Jetty and Pipeline Project
Environment Effects Statement
Contamination and acid sulfate soils
Crib Point to Pakenham

Figure
A7-23

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- LEGEND**
- Sediment Sample
 - Jetty piping
 - Pipeline
 - Total Study Area
 - Gas Import Jetty Works Project Area
 - Port of Hastings boundary

Analytical Results:

As - Arsenic
TBT - Tributyltin (as Sn)

Guideline Exceedances:

24.2: ANZECC 2013 - SQGV-High
0.04: ANZECC 2013 - SQGV-Low



Marine Sediments Results – Exceedances

APA
Gas Import Jetty and Pipeline Project
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Figure
A8